THE
SECOND PART OF THE PRINCIPLES
OF THE

ART MILITARIE,

Practiſed
In the Warres of the United Provinces:

Conſiſting of the Severall Formes of Battell, repreſented by the Illuſtrious MAURICE PRINCE OF ORANGE of famous Memorie,

And his Highneſſe *Fredrick Henrie Prince of Orange* that now is, Lord Generall of the Armie of the High and mightie Lords the States Generall, of the United Netherlands, &c.

Together with
Thē order, and forme of Quartering, ēncamping, and Approching in a warre offenſive, and defenſive.

Compoſed by HENRY HEXHAM, Quarter-Maſter to the Regiment of the Honourable Colonell GORING, Governour of his Majeſties Towne of *Ports-mouth.*

LONDON,
Printed by *Robert Young*, at the ſigne of the Starre upon Bread-ſtreet-hill,
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THE SEVERALL DVTIES OF THE OFFICERS OF THE FIELD BELONGING TO AN ARMY.

And first of the Provoſt Marshall of an Army.

BEcauſe in the nature of his office, he is to execute all directions, and Commandements, that he shall receiue from the Lord Generall, or Marshall, he shal be enioyned to giue, his attendance vpon the Lord Marshall. It is his office to publish all Proclamations, orders and decrees of the Generals, and all things elſe that are to be notified to the Troupes, as the Lo: Marshall shall command him. He shall ſee them published in the Generals quarter, and before the head of euery Regiment, being attended on by the Provoſts of euery Regiment. He shall haue the keeping of the priſoners in the armie, that is to ſay, He shall by himſelfe, and his men keepe the chiefe priſoners, and shall direct the Provoſts of euery Regiment, how the Priſoners in their charge shal be kept.

He shall haue thus far forth Commaund over all the Provoſts in the Armie, as they shall giue an account to him of all the Priſoners they haue, of the quality of their offences, and of the Information againſt them, yea as often as he shall direct and shall giue vp an note, as well of his owne priſoners, as of the reſt, once euery weeke to the Lord Marshall.

He shall attend euery Court day at the Generals, or the Lord Marshals, if it be held there and shall bring his Priſoners that are called for ſafely to the Court, with ſuch Informations and witneſſes, as are to be brought in againſt them: and shall after they haue been heard; and proceeded withall, bring them back in ſafety, and ſo keepe them, till he haue attended and knowne the further will of the Generall, or in his abſence of the Lord Marshall. Alſo he shal be bound to haue his Executioner, A place of execution, and all things belonging vnto it, whenſoeuer, or whereſoeuer he shalbe commanded by the Generall or Marshall, and he shal ſee the ſaid executions ſo commanded duely performed.

The Provoſt Marshall shall haue thus farre Commandement, ouer the Victuallers of the Armie, that he shall aſſigne their quarter in euery Regiment, and shall appoint what victuals are to attend euery Regiment. Alſo he shall giue order to the Provoſts of euery Regiment, that they ſee no victuals ſold, but at conuenient houers, and that the prices of victuals and beere be reaſonable, & euery kan of beere ſold at that price, as he hath marked it vpon the Barrels head, and as is appointed him.

It is further incident to his Office, to haue account brought vnto him of all preyes of Cattell, and other victuals that are brought into the Armie, and that the ſame prey, aſſoone as it comes into the quarter, shal be shewed to him, and by him to the Generall, or Commiſſarie Generall of the Victuals, becauſe it may be knowne, both whether the preyes be lawfull, & how they ought to be diuided.

He shall by the Provoſts of euery Regiment and his ſervants, cauſe all entrailes of Beaſts, that are killed in or neere the quarter, and all other Garbage and filth to be buried, and that in all things elſe the quarter be kept ſweet, and the places adioyning cleane, and that the places of Eaſement prickt out in ſuch a conuenient diſtance, as he shall in diſcretion ſet downe, and that he himſelfe as often as he can conueniently, shall viſite the whole quarter, and shall cauſe the Provoſts of Regiments, and his owne men to viſite the ſeverall parts of the quarter euery day.

He shal haue all fees, aſwell in preys that are taken, as in his ſervice of the overſight of Victuals and Beere, and of all things els, which doe properly, and uſually belong to the Provoſt Marshall of an Army.

Of the Marshall of a Regiment.

THe Marshall of a Regiment, is to receiue and keepe safely all such Prisoners, as are committed to his charge by the chiefes, Captaines & Officers of the Regiment, and shal bring his Prisoners to the Marshal Generals, or to a Court of Warre, whensoever they shalbe called for, or brought to Iustice,

It is also the charge of the Provost Marshal of a Regiment, to take speciall care, that all Women, Lackies Servants, Bread, & Brand-wine-men, belonging to the Regiment shall march after their owne Regiment, and not before, or vpon the flanckes thereof.

It is his duty also, to set such Prizes vpon Beere, and Victuals, as the Lord Marshall or the Sariant Majour Generall have appointed, which order he receiveth from the Provost Marshall of the armie, sees it duely executed within the circuit of the Regiment, that the Sutlars may not sell their Beere or Victuals above the set rates, to grate vpon the souldiers. After the Captaine of the Watch hath gone the first Round, he is to see also that the Sutlars keepes no drinking and disorder in the night, but to put out their Candle-light and fires.

And during the time of divine service, he is to goe the Round, and to see there bee no tipling, or disorders committed in the Regiment.

The Office of a Quarter-master Generall.

FIrst he is to be at all remoues, and before the taking vp of any Quarter, is to attend the Generall, or the Marshall of the Feild to receiue his direction, where and in what place the Armie is to be quartered, and how the Avantgard, the Battle, and the Reergard shal be distinguished.

Hauing received then his directions, and the Armie drawing neere vnto the place dessigned, he, & the Quartermasters of everie Regiment, rides before with a Guarde of Horse & some firelocks to view and make choise of the Ground where the Armie is to be quartered, & there ordaines a Quarter for the Generall, the cheife Officers of the Feild, and their traines, together with the Regiments of everie *Tercia*, and giues out the ground, or lodgings to the Quarter-master of each Brigade, and they to the perticular Quarter-masters of euerie Regiment, who drawes out the Quarters in that order and forme, as the Generall hath prescribed and as the figure thereof following shall demonstrate.

It is also his office to direct the Quartermaster of every Regiment, that they observe, in laying out their quarters, the same forme as the General hath commanded, that is, proportiõ for proportion, and to see that all places of Armes, streetes, sallies, and all things else be answerable, which being done, he visites every quarter to see whether it be made and done accordingly.

The Office of a Quarter-master of a Regiment.

THe Quartermaster of a Regiment in all changes, is to attend the Quartermaster Generall, to receive his directions, and takes the place and ground appointed by him for the quartering and lodging of the Regiment, and then drawes out his quarter for his Collonel & the other Officers of the feild, & every Captaine of each Regiment, according to the order of their march, & their seignorities in the Regiment, distributing and giving to a Sariant of every Companie of the Regiment, who are to assist and attend him, the depth, bredth, and length of the quarter, with the distances of the Alarme place betweene the head of the Quarter and the Trench: and the true distance between the devision of Regiment and Regiment, as also when the Regiment is to be Quartered in Villages, and Houses, he is also to obserue that forme, and directions, which the Quartermaster Generall shall giue him.

The Office of a Trench-maſter.

Becauſe as Quartermaſter he ſhal know the ground that is layd out, ſo he is to execute the Office of the Trench-maſter in the outworkes of the quarter, as he doth of Quarter-maſter within, theſe two Offices having affinity the one with the other; and therefore muſt ſett out diſtances betweene the quarter, the Trench, or Rampier, with the breadth and depth of the Ditch, be the quarter altogether entrenched, or in part, as he ſhall receiue direction from the Generall, or Marshall, and alſo the proportion of all Outworkes, Flanks, Mounts, Batteries, and other workes that shalbe appointed.

As it is showne, what is the dutie of a Trench-maſter in encamping: ſo in marching he is tyed to this, that he doth direct the makeing of wayes, or *Explanadoes* for the paſſing of the troupes, or marching of the Ordinance or Carriages, according as he shall receive direction from the Generall, or Marshall, Provided that in making way for the Artillerie, he take the Quarter maſter a long with him, aſſigned by the Maſter of the Ordinance for that purpoſe, and for the Carriages; and that the Carriage Maſter be alſo there with him.

In all Approaches he is to take charge of the Trenches, and other workes, for which after he hath received direction from the Generall, or the Marshall, he shall give directions to all thoſe that doe worke, and ſee that the workes be carryed in ſuch ſort, as they are appointed. In which ſervice all that doe worke, whether they be *Pinioners*, or Souldiers commaunded muſt obey him.

Of An Inginier.

AN Inginier ought to be a man skilfull and experienced in Arithmatick, Geometrie, and the Mathimaticks, and before he begins to breake ground, or runs his lines of Approches, he ought to conſider well the Situation of the place, and to have regard to the Proprietie, and nature of the place, whether it be high ground, low, Plaine, or hillie.

By day he viewes well the ground, that he may the better run his Approches by night, in ſetting out his ſticks and markes, that he may Place his men to gett into the ground with the more Safety, to make the Corpes de gard, and Batteries vpon the moſt advantagious places, for if he should miſtake his ground, and not run his Approch well, by turning and winding it, and Carrying it from the Bulwarkes flankes, and the outworkes of a Towne, or Fort: he may endanger the lives of many men, and therefore it behoves him to be very Carefull and Circumſpect, but of this wee shall ſpeake more at large, when wee come to handle Approches.

The Office of the Commiſſarie Generall of the Victuals.

HE is to take charge of all the Victuals prepared for the Armie, as well by Sea, as Land-ſervice, and to ſee himſelfe or by his Miniſters the proportion of Victuals to be duly diſtributed to the Souldiers and Matriners, as the Generall, or Admirall shall direct.

All Purſers, Stewards, and all other that shall in any shipp haue charge and overſight in Victuals (as alſo all vnder Commiſſes, and Conductors of Victuals by Land) shall vpon the diſcoverie of the extraordinarie waſting, ſpoyling, or miſcarrying of Victuals preſently giue notice to the ſaid General (or Commiſſarie Generall) of the Victuals, that he may preſently take order in it.

Whereſoever the Armie shall land, March, or lodge, all the Victuals found in ſuch places shal be ſeized vpon by him, and a proportion ſet out by him for the preſent vſe of the Troupes there quartered, and the reſt reſerved as part of the Generall ſtore, and Magazine

of Victuals, and to that end he shall goe himselfe, or send his Officers, or Clarkes to attend on the Lord Marshall, when he or the Quartermaster Generall goe first to view, and take vp the Quarter.

He shall keepe a List of all the Bakers, Millers, Butchers in the Armie, and of all others that are to be used in the Provision of Victuals, to the end, he may set them a worke as occasion and the service shall require.

All Instruments for grinding, Ovens, Baking, or for preparing, bestowing, Carrying, or for the preserving of Victuals shalbe vnder his Charge, and he shall have authority to vse and dispose of them for the publick service.

If any prizes of Victuals shalbe taken at sea, the Commissary Generall of the Victuals shall both take a note or Inventarie of it, and appoint some Officer of his to take charge of it.

If any preyes be taken by land, he shall likewise have a note or Inventarie of all, and view it himselfe, he shall make the division, as he shal be directed by the Generall, or in his absence by the Lord Marshall

He shall give out noe extraordinarie Victuals, but by order and warrant from the Generall, and shall give from time to time an Account vnto him of any wast, spoyling, or miscarrying of Victuals, that shalbe in the Armie by Sea, or by Land.

The Carriage Master his Office.

HE is with as much authority, to marshall, and order all the Carriages of the Armie, as the Sarjant Majour Generall is to marshall the Troupes.

He shall see the Carriages of the Munitions first to be placed in the best, and safest places, next the Carriages of the General, and chiefe Officers of the Armie, the next by their turnes: but because the Incumbrances of carriages, may oftentimes disorder the whole troupes, he shall receive his directions from the Sarjant Majour Generall of the Armie, where his charge shall march, though the particular disposing, and ordering of the carriages be left to himselfe.

Hee shall haue three severall men, or Officers of his called Conductors, to attend vpon the severall divisions of Carriages, as sometimes vpon the Baggage of the vantguard, the Battell, and the Reereguard. Sometimes vpon the Carriages of munition, and Ordinance, the Generalls and chiefe Officers carriages, so that in the order of marching they shall be divided into three bodies, and he shall have some Smithes, Carpenters, and wheele-wrights attending vpon every seuerall division. His best order in marshalling the Carriages, will be to observe the same course, that the Seriant Maiour doth in marshalling the Regiment, the which by the Provost of every Regiment, he may give notice to all them that goe along with the Carriages.

His direction being given, he shall oversee the whole order of march for all the Carriages, and shall make the Provosts of the Regiments keepe the same order.

The Muster masters Office.

HE shall having order take a Generall-muster of the whole Armie before it be embarqued or march, and keepe a perfect List of the number of Armes, a Coppie of which List he shall deliver over to the Generall, that he may know the strength of the Army.

Hee shall make reviewes as often as the Generall, or in his absence the Lord Marshall shall appoint, and shall alter his List as he finds altered in strength, and shall keepe Notes of the alteration, betwixt every muster, and of the causes of the diminishing of the strength of the Troupes, That is to say, what men are slaine vpon service, and what are dead of sicknes, and what men are run away, or discharged by pasport.

He shalbe respected, and obeyed in the execution of his Office, and no Colonell, nor

Captaine

Captaine, shal refuse to shew him their men, whensoever he shall require them from the Prince or Generall.

Of the three Cheife Officers of a Regiment.

First of the Sariant Maiour of a Regiment.

A *Sariant Maiour* ought to be a Valiant man, an old Souldier, and one that is well experienced in the way of his profession, vpon all occasion his place gives him accesse to the Generall, the Marshall of the feild and the *Sariant Maiour* Generall of the Armie, to know when, how, and in what manner his Coronels Regiment is to march, whether in one bodie alone, or else in two divisions ioyned with others.

Whereupon he gives order how the Regiment is to be marshalled, and ordered, in what forme the Companies are to draw, and when vpon any service they are disbandied, how to really them againe as is required of him.

He receives his orders and Commands, either immediatly from the Generall himself, or from the Marshall or *Sariant Maiour* Generall as is said, whether the Regiment be to march in the *Vantgard*, the *Battel*, or the *Reereguard*, and ought to have some knowledge how the Countrie lies through which the Armie is to march, whether over a Spacious *Campanie* in Battaille, or through narrow passages, over rivers, woods and the like, by drawing out of files, as the ground and passage will afford, as also what forme the Regiment is to hold, if they should be charged with horse, have ordinance playing vpon them, or troubled with much baggage.

He shall in the presence of his *Coronel*, or Lieutenant *Coronel* be an assistant to them, in seing all orders and directions executed and performed, and in the absence of them both, to have the same authority, and Commaund, that the *Coronel* himself shall have.

In marching or Imbattailing, he shall keepe as neere the midst of the Regiment as he can either in the front, the Reere, or the flankes, and so he may best overlooke, and observe the order of their March or imbattailing.

The Regiment being drawne vp in divisions, he gives to every Captaine, and Officer his place, according to his seignority, and withall commaunds the *Drummaiour* and the other Drummes to beate a march, and to move all at an instant, and see that the souldiers keepes well their rankes and files, and none disbandie themselves, or straggle.

He shall come every morning, and evening to the *Sariant Maiour Generall* of the Armie, or to the *Sariant Maiour* of *the Brigade* or *Tercia*, to receive the *Word* and orders from him, if there bee no extraordinarie cause to hinder him: and when he hath received the *Word* from the *Sariant Maiour Generall*, or from the *Sariant Maiour* of the *Tercia* his Coronell and Lieutenant Coronell being present in the Quarter he gives them first the *Word* and orders, and afterward delivers it over to the *Sariant maiour* of that Regiment, drawne in a ring according to their Captaines *Seignoritie*, which are to come and attend vpon him for the same.

As he doth receive directions for marching, imbattailing, viewing of ground, and placing of guards from the *Sariant Maiour General* or the *Sariant Maiour* of the *Tercia*: so he is to deliver them over to the Captaines, and Officers of that Regiment, and to call vpon those to whom it doth appertaine, to see them duely executed.

Everie night he is to visite all the *Guards* of the Regiment, and to keepe the turnes of the watches, and marches (that one Captaine may not doe more duty them an other) as also in sending out troupes vpon service, to the end, both the labour, and the honour may be equally devided.

It is also his dutie to speake for Amunition, as powder, Bullets, Match, and victuals for the Regiment, if there be any want, and to see them equally distributed to the Companies, according to the proportion given out, and finally to give order and proportion for the number of Commanded men, of the Regiment that are to goe to worke.

Of a Lieutenant Coronell.

THe next place above a *Sariant Maiour*, is a *Lieutenant Coronell*, which is an honorable charge, when his *Coronell* is preſent, he is to aſſiſt and obey him, in ſeeing all the Commaunds and directions, that are dilivered by any publick Officer, or ſuch as ſhal be within the authoritie of a *Coronell* himſelf, to be duely executed in the abſence of his *Coronell* he hath as abſolute command, and authoritie over the Regiment, as the *Coronell* hath himſelf.

In marching or imbattailling, if the Regiment conſiſts but of one deviſion, whenſoever the Coronell is in the head of his Regiment, he is to bring vp the *Reere* of that Regiment, but if there be two diviſions, then the *Coronel* leads the firſt, and the *Lieutenant Coronell* the ſecond, but when his *Coronell* ſhal be in the *Reere*, marching from an Ennemie, then it is his place to be in the head.

If the Regiment conſiſts of two *Battaillions*, his deviſion is to quarter and lodge on the left hand of his *Coronels*, and himſelf in the *Reere* of his owne Companie.

Of a Coronell.

A *Coronell* hath a very honorable Command, and is called in Spanish and French *Maſtro del Campo*, or in French *Maiſtre de Camp*, that is one of the maſters of the Feild, and therefore ought to be a man of Authoritie, and reſpect, having abſolute Commaund over the Captaines and Officers of his Regiment, and all ſuch are to reſpect his Commaunds, and obey him, as fully as they would doe the chiefeſt Commanders, & ought to love and honour him, which his valour, wiſedome, and direction will acquire him.

Alſo he ſhall ſee that all orders, Commandements and directions, which are delivered him by the publick Officers of the Armie for guards, marches, quartering, or any thing elſe, for matter of Juſtice, or for ordering of the troupes and furtherance of the ſervice, be duely executed, and performed within his owne Troupes. Further, if he himſelf doe finde any mutinie, or any diſcontented humours tending to mutinie, extreme outrage, or diſorder, or ſhall by any of his *Captaines*, Officers, or Souldiers be informed of any ſuch thing, he ſhall forthwith advertize the *Generall*, or Lord Marshall of the Feild. And if he finde any other fault, negligence, or ſwarving from either the directions, or the policie of the Armie ſet downe, he ſhall ſtraightwaies acquaint them by whom ſuch direction did, or was to come vnto him, or ſome other ſuperiour Officer, if he cannot conveniently acquaint him with it, and ſhall produce the party ſo offending, with the witneſſes and proofs that order may be given forthwith, and iuſtice done. And if he faile to give this information of any thing he knowes, or heares of, he ſhal be thought deepely faultie, or if any ſuch things paſſe without his knowledge, he ſhal be thought of worſe government then befits a man of his place and charge.

Vpon marches the *Coronell* ſhal be at the end of his troupes, that is, neereſt the Ennemie in the head of his Regiment going towards an Ennemie, and in the *Reerward* comming from one, and he ſhall not goe from thence, except it be for the ordering of his troupes, or ſome extraordinary occaſion to attend the *Generall* or the chiefe Officers of the Feild.
Alſo he is to ſee and commaund that his Regiment be well armed and exerciſed.

A *Coronell* being one of the chiefe Officers of the Feild, ought to be called to take Councill and advice with the *Generall*, eſpecially, vpon any peece of ſervice or in the day of Battle, which concernes his charge, where he may freely with others ſpeake his opinion of matters of weight, and importance. And though his opinion may be good, yet if the moſt voices be of the Contrarie opinion, and that things in the execution thereof ſhould fall out ill, howſoever, he ought to give way and ſubſcribe vnto the plurality of voices, and wholly

wholly obeying his *Generall*, be ready to execute all his Commaunds, giving thereby to vnderſtand, that the contrarie opinion, which he held in the Councill of warres was neither for want of Courage nor affection.

A *Coronell* ought alſo to give all reſpect love and obedience to the *Generall* of the Armie, the Lord Marshall and the *Sariant Maiour Generall* of the Feild, as having charge from the *Generall* to give out orders, to quarter and appoint allarme places, the place of Battaile, for marching, chooſing of guards, and ſending out convoies. Alſo once every weeke the *Coronell* may call together all his Captaines and shall enquire of all Offences hapned in his Regiment, and examine duely the nature and quality of ſuch Offences, and to prepare the cauſes for a more short and eaſie hearing in a Marshals Court, for all *Coronels* are to repaire to a Court of warre as often as they shal be warned, as an aſſiſtent to the Lord marshall or preſident of the Council of warre in all cauſes, that shalbe queſtioned there, belonging to the iuſtice of the Armie.

Finally, in quartering or lodging, if his Regiment conſiſts of two diviſions, he shall quarter in the diviſion that is betweene his two battaillions aſſigned for his Regiment, becauſe ſo hee may beſt give directions to the whole, but wee shall shew this more particularly, when wee come to draw out the Quarter for a *Coronell* of his Regiment.

Of the Sariant Maiour Generall of an Armie.

THe Office of the *Sariant Maiour* of an Armie, is a place of a high degree, whoſe Commaund, is full of action, and therefore ought to be an able, a wiſe, a grave, and a valiant perſonage, experienced in the way of his profeſſion.

He is to come to the *Lord Generall* or *Lord Marshall* for directions for all watches, and guards, that are to be placed: and vpon the change of a Quarter, or a remove, he is to march with the *Generall*, or the *Lord Marshall* in the *Vantguard* (after he hath ſeene the Troupes ſetled in the order of their march) and to view the places appointed him by the *Generall*, or *Marshall* for the placing of the guards vpon the very firſt arrivall of the Troupes.

Having received the *Word*, and his *Orders* from the *Lord Generall* or the *Marshall*, he delivers it to the three *Sariant Maiours* of the *Tercias*, called alſo the three *Corporals of the Feild*, and they give both the *Word*, and orders to the *Sariant Maiours* of every Regiment.

Hee himſelfe in the beginning of the night, after the warning peece is gone of, and that all *Guards* are ſetled, he is to viſite them, and gives order to the three *Sariant Maiours*, or grand Corporals of the *Feild*, that attends vpon the *Vantguard*, *Battle*, and *Reereguard*, at what time they (or ſome chiefe Officers of the *Feild*) shall goe the *Graund Round*; and if he, or they finde any thing amiſſe, or any thing extraordinary diſcovered, either when he goeth himſelf, the other three *Sariant Maiours* of the *Tercias*, or any other chiefe *Officer*, they are to giue an account to him, and he to adviſe the *Lord Generall* or *Marshall* with it.

In a day of *Battell*, or any kind of fight, he is to come to the Lo. *Generall* or the *Marshal* for directions, and to ſee thoſe directions executed.

In a day of Battell alſo, he hath the ordering, and diſpoſing of the diviſions and *Battalions*, according to that forme, which the Generall Commaunds, and vpon all occaſions is actiue and ſtirring vp and downe, to ſpie out all advantages, which may offend an Enemie, and wiſely to foreſee all diſadvantages, which might annoy, or bring the Troupes into any diſorder.

Alſo he is the firſt chiefe Officer, which is to be at the *Rendevous* for the receiving, and diſpoſing of the troupes of horſe and foote, as alſo in giving order to provide them with Ammunition and Victuals.

And being arrived firſt at the *Rendevous*, he is to give the *Lord* Generall and the *Lord* Marshall, to vnderſtand the ſtate of the Armie, that the *Lord* Generall, may therevpon give him commaund, and direction, how, and in what manner, the Army is to be ordered,

and afterward gives order to the Sariant Maiours of the *Tercias*, and they to the Sariant Maiours of the Regiments, for the providing of Ammunition, Victuals, and all things neceſſarie for the ordering of the march.

He ought to be well acquainted with thoſe paſſages, and wayes through which the Armie is to March, and Commonly Marches in the head of the *Vantgard*, hauing ſome light horſe and firelocks to attend him, and to ſend out ſome troupes, to diſcover the waies, and paſſages, for the preventing of *Ambushments*, hauing the Captaines of the Pionniers to wayte vpon him and the *Quartermaſter Generall*, for the makeing and explayning of waies for the Armie, that they may not be ſurprized on a ſuddaine. And drawing neere vnto the Place of Quartering, or encamping, he, and the *Quartermaſter Generall*, riding before do view, & chooſe out ſuch ground and villages, as may be moſt commodious for the lodging, and Quartering of the Armie.

To Conclude, he is to haue abſolute Commaund ouer the three *Sariant maiours*, or Corporals of the feild, who are to be his *aſſiſtants* and his mouth, as he is the mouth of the Lord *Generall* or *Marshall* and therefore hath a vigilent eye ouer all things, and ſees that the Generals Commaunds deliuered to him, be ſtrictly kept, and obſerued.

The Office of the three Sariant Maiours of a Brigade, or Tercia, otherwiſe called Three Corporals of the feild.

THe States Armie by order from his higneſſe, the *Prince of Orange* is Commonly vpon a march diuided into three *Brigades*, or *Tercias*. Ouer each Tercia their is a Sariant Maiour of the feild, and in our Armie three, namely Sir *Iacob Aſhly* Lieutenant Coronell ouer the English, *Monſieur Buat* Lieutenant Coronell ouer the *French*, and Sir *David Balford* Coronell ouer the *Scotch*. In French he is called *Le Mareſchal*, or *Le Sariant Maiour de Battaille*, and in English one of *the Great Corporals of the Feild*. A Sariant Maiour then of a *Tercia* doth receiue his order, either from the Lord General himſelf, or the Lord Marſhall, but moſt commonly from the *Sariant Maiour* Gen. aboue mentioned. In what forme the *Tercia*, is to be ordered, and march, with what Regiments of foot, horſe, Ordinance and Baggage. Hee aſſignes and ſhewes them the Place, where they are to draw out in Battaille, and from the Sariant maiour Generall, whether they are to march in the *Vantgard*, the *Battell*, or the *Reeregard*, ſo that in marching euery one of theſe three ſhall attend vpon his *Brigade*, and ſeuerall diuiſions, and in the abſence of the Sariant Maiour Generall, ſee that the order of Marching, or Imbattailing be duely obſerued. And ſo euery one of theſe three Sariant Maiours of the feild ſo aſſigned, ſhall be at the Commandment of him that Commaunds that *Brigade*, or *Tercia*, to be ſent to the Lord *Generall*, *Marshall*, or Sariant Maiour Generall, vpon any occaſion that belongs to the ſervice.

Theſe three Sariant Maiours of *Tercias*, are to be lodged as neere the Sariant Maiour Generall, as conueniently may bee. And theſe three which attends vpon the *Vantgard*, the *Battel*, and the *Reereguard*, ſhall with the *Sariant maiour Generall* make choiſe of ground for the placing of the guards, which they aſſigne vnto the *Sariant Maiours* of the Regiments, and ſhall goe the Round, and viſite the guards commonly euery night, and at ſuch an houre, as the *Sariant Maiour* Generall appoints them, and as often, either by night, or by day as he ſhall direct them.

If any of theſe three *Sariant Maiours* of the Feild ſhall finde any want of powder, munition, or Victuals in the *Vantgard*, *Battell*, or *Reeregard*, either in march, when the troupes are lodged, or quartered, or during any fight: He doth advertize the *Sariant Maiour* Generall of the Armie, with the ſaid wants, and then by his direction, ſhall goe with an Officer of euery Regiment of that *Tercia*, to the Maſter of the Ordinance, the Lieutenant of the Ordinance, or to the Commiſſarie Generall of the Munition or victuals.

To conclude, he receiuing the *Word* and orders from the Lord Generall or *Sariant Maiour* Generall of the Army, giues it to the *Sariant Maiours* of the Regiments, but becauſe ſometimes, when the *Word* is to be ſent to all the Quarters, the *Sariant Maiour* of

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euery Regiment cannot conveniently come to the *Sariant Maiour General* of the Army for it. The *Sariant Maiours* of the *Tercias* do attend vpon the *Sariant Maiour* of the Armie euery morning, and euening to receiue orders, and to carry the *Word* vnto the seuerall Quarters, where the *Sariant Maiours* of euerie Regiments comes vnto him for it.

Of the Master (or Generall) of the Ordinance.

HEe hath the charge of all the Artillerie, Armes, Munitions, Engines, Matterials and Instruments for worke, yea of al things that belongs to the Ordinance, as Bedds, Carriages, and all things that appertaines to the Office of Master of the Ordinance.

Vnder the Generall of the Armie, he hath absolute Commaund, over all Officers belonging to the traine of Ordinance, as the Lieutenant of the Ordinance, the Controuler, the Clarke, the Gentlemen of the Ordinance, the master Gunners, Armores, munitions, Inginiers, Captaines, of Pyoniers, and Mineurs, ouer all Smithes, Carpenters, and Wheelewrights, And over all Artificers, and Attendants vpon the traine of the Artillerie, Munitions and Matterials.

The Master, or Generall of the Ordinance (after the places for Batteries are chosen, & assigned him by the Generall of the Armie,) he is to obserue, Command, and direct the making of Gabions, Bedds, aud platformes for the Ordinance, and to giue direction for the making of waies and Explanadoes, for the bringing of the Ordinance vp to the batteries, to see that the Batteries be made Canon proofe, and the portholes so, that the Ordinance may most annoy an Ennemy.

And after he is once commanded by the Generall to begin a battery, he is to giue directiõ to his inferiour officers, to play and beate with the Ordinance vpon such and such places, till the Generall giues order to the contrarie, and as occasion and ground is gained to advance and remove the ordinance to neerer places. Also in a day of battell or fight, he is to choose the most advantagious places, for the planting of Ordinance, where they may gaule and offend an Enemie most, having a Vigilant eye that all things be done in good order.

All the Ordinance and Carriages belonging to the traine of his Office, are vpon a march, in the safest place, and are to take place before all the other Carriages of the Army, unlesse some of the Ordinance be drawne to march in the *Vantguard, Battell, or Reere*, or to some other places, where the necessity of seruice may require.

He is to make orders and Lawes for the well-governing of his Inferiour Officers and all Artisans appertayning to his Office, with which he is to make the Generall acquainted, that he from time to time, may know the State of the Ordinance and all things belonging thereunto, and take care that the service of the Land be in no wise defrauded.

The rest of the Officers vnder his command, and the dependances thereof shal be handled more particularly in a treatise apart.

Of the Commis of the Ammunition and Matterials.

THe *Commis of the Munition and Matterials*, is vnder the traine of the *Master of the Ordinance*, he by order from the *Generall, or the Sariant Maiour Generall*, gives out al Munition, as *Powder, Bullets, and Match*, to the Regiments, and Companies, according to the proportion Commanded by the Generall: and as he receiues his List and Billett from the Sariant Maiour Generall of the Army, for which orders being giuen out, the Sariants of euery Companie repaires to his Lodging, or quarter, to receiue it and giues an acquittance vnder their hand for the receit of it. Likewise what powder, *Bullets or Match* are spent and shott away in the Approaches or Trenches, The Colonell which Commands there, giues him his hand, how much powder, how many firkins of Bullets, and how much match was spent and shott away that night, and the day following, because he is to giue vp an

account vnto the States, and Generall how it was beſtowed.

Moreover, for entrenching, outworkes, and Approches, he is to deliuer to the Quartermaſter of euery Regiment, as many Matterials: to witt, ſpades, showels, Axes, pickaxes, hachets and bils, as there are workemen Commaunded out of euery Regiment, and Company, to go to worke, which matterials the Quartermaſter is to paſſe his hand for, and to diſtribute them to the Companies, and when the worke is ended, to deliver them vp againe, or to giue him a Reckoning, how many are broken, or loſt vpon ſervice, that the Commis may render vp an account of them to the States.

Of the Lord Marshall of the Feild.

THe *Lord Marshall* of the Feild, is in Commaund, and authority next vnto the *Generall*, and is (as it were) his Lieutenant, and Mouth, and therefore being in ſo eminent a place, ought to be acquainted with the duties of the other Officers of the Feild, eſpecially, with the Generals Office it ſelf, becauſe there is ſuch an affinity betwixt them, as hauing abſolute power to commaund the Armie in the Generals abſence, and oftentimes he may be emploied to Commaund an Armie himſelf, as Commonly the Lord Marshals of France doe.

His chiefe Office is, to ſee that Iuſtice be duely adminiſtred, and that the lawes, Articles, and Ordinances of Marshall diſcipline, be ſtrictly kept and obſerved, that all banishments, and Proclamations comming either from the Generall, or Councill of warre be published and executed, and by his Authority to cauſe Malefactours, and offenders to be punished as an example to others. And ſeing that all he doth, is for the Generall good of the whole Armie, he ought to be honored, and reſpected of all men and in no wiſe Contradicted: It is his proper charge, to take care, that the policy and diſcipline of the Armie, and the orders eſtabliſhed by the Generall, be exactly kept and obſerved vnder his authority.

All quarrels, and Duels, hapning betweene Officer and Officer, between Souldier and Souldier, either, Horſe or Foote, ought to come before him, being his Office to right the wronged, to punish the Offendour, and by his wiſedome, and authority to appeaſe and compoſe them.

The Lord Marshall when the *Vantgard* is drawne out, and ranged in Battaille, while the Battell, and the Reere are a diſlodging, he ſees that both Horſe, and Foote march orderly and in their owne place.

And with ſome choiſe Troupes marches before the *Vantgard*, and Conſiders the waies and paſſages, as valleys, Rivers, Marras, Bogs, mountaines, hils, hedges, woods, hollow, and Narrow waies, through which the Armie is to paſſe, that he may order the march accordingly, as alſo to ſend out Scouts, Guides and Eſpies, to diſcover and get intelligence from an Enemie.

He alſo marches before the head of the Armie, ſometimes with the *Sariant Maiour* Generall, the Quartermaſter Generall, and the Quartermaſters of every Regiment experienced men, to view and make choiſe of the ground, where the Armie is to be lodged and Quartered. He obſerves alſo the marching, Quartering, and order of fighting, three chiefe things belonging to an Armie, and ſees and Commaunds, that the march, Quartering and fight be conformable to that order, which the Generall hath preſcribed. And the Deviſions and Troupes ranged in Battaille: he is full of action, and conſiders the place and ſoile of the ground, the advantages of the Sunne, and winde, and how the Troupes with moſt advantage may be brought to encounter an Enemy, taking care that the order commanded by the Generall be not changed, and in fight he ſees that they be duely ſeconded, and relieved, and being ouerlayd or charged, to cauſe them to retreate orderly, for the auoiding of confuſion, hauing a vigilant eye vpon all caſualties, which may happen. For, what the Gen. ordanies, the Lord Marshall ſees performed and executed, to the end, that both their deſires may take one effect. For when Commaunders vndertakes a warre, and fight with Councill

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and Iudgement, and ſees all things executed with wiſdome, diſcretion, and valour, giving the ſucceſſe to God, no man can be blamed.

The Lord Marshall alſo ought to be acquainted with the Generals deſſigne, and whether hee is reſolued to fight with an Enemy or no; to conſider whether hee is to charge an Enemy in the Front, in the Reere, or on the Flancke; to hinder them from Quartering, and to ſend out Conuoies for the cutting off of his Victuals and proviſions.

He ought to conſider likewiſe, how an Enemie lies encamped, which way he can come beſt to attempt him, which way he marches; and whether his deſſigne tends, what order he keepes, with what Troupes he may hinder or annoy an Enemie, or being once engaged in fight, how he may beſt ſecond, and relieue his owne men, either with Horſe, or foote, to place and bring up the diuiſions of Muskettiers, where they may moſt offend and gaule an Enemie, and how the bodies of pikes may with the moſt advantage bee brought to the charge and ſhock.

As alſo to underſtand of what ſtrength in horſe and foote the Enemie is, what Baggage and Carriage and incumbrances he hath, and whence his Victuals are to come, to know whether an Enemy is to ioyne with an other; and how, and in what maner he may beſt break that Coniunction.

Hee is to haue by him alſo, an exact *Mapp* of that Countrie, and a diſcription of all the waies, and paſſages through which the Armie is to paſſe, having alſo good *Guides*, wel acquainted with the ſeverall paſſages of that Countrie and place.

The *Lord Marshall* likewiſe, with the Sariant *Maiour Generall* of the Armie, appoints all places for *Watches and Guardes*, either of Horſe, or Foot, which he aſſignes to the Sariant Maiours of the *Tercias*, and they to the Sariant Maiours of the *Regiments*, the places, which they are to maintaine, and make good. Alſo the *Alarme Places*, and makes choiſe of the ground to fight a Battell in; for the better ſafety and defence of the Armie.

In the day of Battell he is full of Action, continually in motion, ſtirring vp and downe to giue directions where need requires, to encourage the Souldiers, and Officers, and to find out all advantages, where they may moſt offend an Enemy.

Vpon a March, or being encamped, he ought to countenance, and favour Marchants, Victuallers and others, which furniſhes, and brings proviſions vnto the Armie, and giues Commaund, that they be not abuſed, and wronged, but may ſell their proviſions and Commodities peaceably. As alſo he giues order by his authority to the *Provoſt Marshall Generall*, and to the *Marshals* of everie Regiment, to ſett reaſonable rates, and prices vpon Victuals and Beere for the good of the ſouldiers.

There are divers other points appertaining to the Office of the *Lord Marshall*, but for brevity ſake, I will now Omitt them.

THE OFFICE OF THE LORD (OR *Captaine) Generall of an Armie.*

A *Generall* hath abſolute Commaund ouer the whole Army, and is to know, and to vnderſtand well, the charges and duties of euerie Inferiour Officer vnder his Commaund, and ought to be a perſonage of great experience, wiſdome, and diſcretion, that he may be capable to diſcerne, and chuſe the beſt of different opinions, which often fals out in Councils of warre.

Yea, to be a perſonage diſcended of ſome noble houſe and famillie, which will giue a luſtre vnto his Commaund, a man of an vndaunted Courage & authoritie, ſeuere and auſtere in his Commaund, who ought to be greatly honored, feared, and reſpected, a man full of reſolution, and magnanimity in the daie of Battell, and conſtant andreſolute in deſperate caſes, happie in his deſſignes and enterpriſes, and aboue all religious, invocating God to be propitious vnto him, and to giue a bleſſing vpon his deſſignes, to giue him knowledge, policie and vnderſtanding, how to order and Gouerne his Armie well, that he may keepe it vnder good diſcipline, and to make it not onely capable of vanquishing, but alſo Victorious, which depends onely vpon the Almighty power of the Lord of Hoaſts, and that neither good, nor bad ſucceſſe ſhould make him change, or alter his Countenance, but vpon the hotteſt ſervices, to giue out his orders and directions with temperance and modiration without impatience, Choller, cruelty, or emulation, againſt thoſe that vnder his Commaud, haue gained honour and deſerued well, which, he ought rather to advance and reward them, and this will make him to be honored, loved, and reſpected of all men.

A *Generall* then ought to be qualified with theſe excellent vertues, namely, *wiſedome*, *Valour*, *Experience*, *Providence*, *Conſtancie*, *Authority*, and *Liberalitie*, and should ponder, and Conſider well, the occaſion, which may engage him in a fight, or moue him to giue battell to an Enemie, to be ſparing, and a good *Menagier*, of the lives of his men, and not rashly and unadviſedly to hazard his Troupes, for he may vanquish, aſwell by *Policie* (in foreſeeing all advantages and diſadvantages) as by *force*, by pulling on the *Foxſes* skin, aſwell as the *Lyons*, as by ſurpriſing an Enemy vnawares, by laying hold vpon an advantage, when their Troupes are in diſorder, when they are diſperſed, when they are dishartened, harryed, and wearied out, when they are pinched with hunger, thirſt, and cold, and ſuch like caſualities, and accidents which may befall them.

Moreouer, in ſeeking to diuert, amuze, and divide their Armie, while he keepes his owne in peace, concord, and vnity, which is one of the Principle points of warre. To gaine time, and advantagious places, and to prevent, and hinder an Enemie from poſſeſſing them, to ſeeke by all meanes to divert, and breake an Enemies deſſigne, and to put his owne into execution with expedition, and to premeditate and ouerweigh a thouſand things, which depends vpon the warre, having a vigilant eye vpon all accidents that may happen, for the Art military hath many difficulties attending vpon it, and one is not able to expreſſe the many hazards, ſtraights, and differences which may fall out in this profeſſion.

Hee ought not lightly to hazard his men vpon skirmishes, or in a Battell, (vnleſſe he be forced to it) but vpon very good grounds, and advantages, for having fleſht his men in ſmall occaſions, it hartens and enbouldens his ſouldiers, and giues them the more encouragment: and aſſurance of good ſucceſſe in greater for they perceiuing the valiant, wiſe, and able Carriage and Conduct of their Leaders, & Commaundours, eſpecially of their Generall, this makes them fight brauely, and gives them a hope of Victory.

A Generall alſo ought to take the graue ſage Councill and wiſe advice, of his chiefes, and Commandours, and (as is ſayd) to make choiſe of the beſt, and yet not to make knowne his owne reſolution; for many a brave attempt and enterprize hath bin broken for want of *Secrecie*, and if he should reueale it to ſome intimate friends, yet to doe it very ſparingly and reſeruedly, by which meanes of *ſecrecie*, he shall gaine knowledge, and experience, and in an inſtant will be ready to lay hold vpon ſuch & ſuch occaſions, as may execute his Reſolution,

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and thereby make him capable of preuailing.

A Generall ought to take care, that his Armie be not wearied out, and fatigated ouermuch, which breedes ſickneſſes, and cauſes the weakning thereof, to ſee & Command that the Regiments be well armed, and duely exerciſed, in all the ſeuerall motions of warre, that Iuſtice be readily executed, to be fauourable to good men, and ſeuere againſt euill doers and Offendours. It is alſo the Office of a Generall to giue Charge, that the Armie be prouided with Victuals, amunitions, and other things belonging to the warre.

A *Generall* ought to ſpeake diverſe languages, for hauing to doe with ſundrie Nations vnder his Command, being able to ſpeake vnto them in their owne language, this giues great deale of Contentment.

Moreouer, he ought to be learned, a good *Mathematician*, and well ſeene in the points of *Fortification*, and to haue excellent Inginiers about him, that are carefull in running the lines of Approches for the preſeruation of the liues of men.

It is requiſite alſo, that he ſhould haue good *Guides*, and ſpies about him, to get him intelligence of the State of an Enemie, and ought to ſpare no money that way, for the breaking of an Enemies deſſigne, and the aduancement of his owne.

A braue Generall alſo conſiders, that the force of an Armie conſiſts not in the multitude of men, but in Valliant and well experienced ſouldiers, and Officers, which are well inſtructed, and trained vp in the vſe of their armes; and knowes that Victorie conſiſts not in many Troupes but that an Enemy may be more ſtronger then his as oftentimes hath hapned but in obſeruing of good order, and dicipline chooſing of aduantages of wind, Sunne, and ground, together with the ready obedience of his men, in executing of his Commaunds, for by experience in their profeſſion, they become more bould and confident in fight, ſo that an old beaten ſouldier, knowes it by heart, what his Chiefe and Generall requires of him

As a Generall ſhould be beloued: ſo likewiſe he ought to be feared and of the two among Common ſouldiers rather to be feared; for the moſt part of them, are rather reſtrayned from doing euill, for feare of punishment, then for any loue they beare to their Generall.

To conclude, he ought to be experienced in the beleegring of Townes, and Forts, to view all places of advantages, and where an Enemy may moſt offend him, to fortifie his Campe ſtrongly with lines of *Circumvalation*, *Forts* and workes vpon it, to know the ſite, and ſituation of a towne, how, and in what manner thoſe within are able to defend it with men and munition, to cauſe his Inginiers to be very circumſpect, and Carefull how they run their lines. to ſap forward to the weakeſt part of that Towne, or fort which he intends to become Maſter of, with diverſe other things requiſite in a brave Generall, which for brevities ſake I will omit.

NOW FOLLOWES IN WHAT ORDER

an Army ought to march in over a Campaigne, narrow passages, Woods and Rivers.

HAving showne the severall Offices of the Officers of the field, it resteth now to speak something in what order an Armie ought to march.

The Armie then being come to the *Rendevous*, or being to disencampe from any place, the afternoone, or evening before the breakeing vp of it, orders is giuen out, that the Souldiers shal be provided with Munition, and so many dayes Victuals, as the Generall shal Command.

But an Enemy being neere at hand, when the Generall will conceale the breakeing vp, they draw into Armes silently, without sounding of Drum, or Trumpet.

The Generall being attended vpon before his Lodging, by the Sariant *Maiour Generall*, *the Quarter master Generall*, *the Captaine of the Pionniers* and some other Officers.

The most part of the Armie, being drawne into Armes, the Generall giues Command to the cheife *Ingenier Quartermaster* or some other, to throw downe the Trench, fill vp the Ditch, and to make such Cappes in it, that whole devisions, and Battaillions may march through them.

After the Trench is cast downe, the *Generall, or the Sariant Maiour Generall* from him, gives order that the *Avantguard* shall draw forth, and march a good distance without, and there to stand, and make a halt, till the *Battell* and the *Reere*, be also drawne out, in obseruing a convenient distance betweene them, In the interim the Ordinance, Carriages, waggons, and baggage that belongs to the Armie, are likewise drawne out, and put into order. And the Guides, Scouts and Pyonniers sent out before into the Countrie, to discouver and to set out Centinels of Horse vpon all passages, and heigths, while the Armie is a marching forwards.

The Master of the *Ordinance* being present, Commaundeth where the Ordinance and the traine of Carriages belonging to them shall march. And giveth order to the Conductours, and Inferiour Officers, to march forward, as the nature and propriety of the waies will permit. And if there be any rough waies, which are to be explained, he Ordanies the Captaine of the Pioniers, and his men to make them plaine and even, likewise all the waggons of Amunition, & Victuals with the baggage, are put in order by the Carriage Master, and conductours of the traine: but the waggons and Cars belonging to the Horse, they are ordered by their Officers, to march according to the *seignority* of everie Regiment.

How the Artillerie and the Carriages are to March.

The Ordinance marches first with all the Carriages, and the Pyonniers are alwaies by them, having noe other waggons mingled amonge them, and so march in their order onely with one waggon before them, laden with spades, showels, Axses, hachets, and biles, and other instruments to make the wayes, and explaine the ground and ditches, after which is drawne an Instrument, which doth make a *rut* vpon the waye, to show which way the Canon is to passe. The lesser lighter peeces of Ordinance layd vpon their Carriages, followes the said Instrument, and afterward the great peeces drawne vpon block-waggons, when there is no danger: but expecting to be encountred by an Enemie, they draw them upon their Carriages for feare of loosing time in mounting them, while an Enemie might fall vpon some part of the Armie. Next after the Ordinance followes the waggons with Instruments, and tooles for Carpenters, and Smiths, the waggons laden with Bullets, powder, and match, and after them waggons with Pikes, and muskets all which being passed; then followes the waggons belonging to the Generall of the Ordinance and his Inferiour Officers. And after them all the waggons laden with munition for the Ordinance, and the Armie, the waggons laden with Victuals and provisions, and waggons for the sick and hurt, and last of all the baggage, belonging to the Officers of the whole Armie.

But when necessitie requir es, some Feild peeces marches before in the head of the Armie, when

when and Enemie is expected to fall on, with which there marches ſome waggons laden with powder, match, and Bullets to be vſed vpon any occaſion.

All the Ordinance, carriages, and baggage being thus ordered, and the armie devided into the *Vantguard*, the *Battell* and the *Reere*: the *Sariant Maiours* of the foote Regiments, and the Commiſſaries of the Horſe Troupes, having received order, which way they are to leade the Troupes, that they may give noe hindrance one to an other, the *Generall*, or the *Sariant Maiour Generall* gives Command, that the *Vantguard* ſhall begin to march, and ſends out before Guides and light horſemen, to diſcouver the paſſages: yet ſo, that they ride not ſo farre afore; but that they keepe alwaies within ſight of the *Vantguard*, that vpon any diſcouverie of an Enemie, they may advertize and give them warning of it in time.

The *Vantguard* then (as is ſayd) hath Commonly ſome ſmall peeces of Ordinance marching before it, which likewiſe may happen before the *Battell*, and in the *Reere* of all, and a greater number of horſe, and foote, as the neceſſitie may require, ſo that the three *Tercias* of the Armie, are all of them provided with Ordinance, where it is thought moſt needefull, and where it is imagined an Enemie may give an attempt, either vpon the *Front*, the *Reere*, or vpon either of the *Flankes*: for which one can give noe certaine rule, but muſt defend themſelves in that place, where the occaſion preſenteth it ſelfe.

When the *Campagnie* Heath or Feild, is ſpacious and large, then one may march in full Battaile by diviſions, and cloſe by an other in good order, which an Enemy perceiving, it may be he dares not offer battell otherwiſe every diviſion, and *Battaillion*, may march by it ſelfe with more eaſe and liberty, then when they are ioyned cloſe together: yet ſo that in caſe of neceſſity they may eaſely be drawne together, as likewiſe the Ordinance, and baggage drawne to that place, where they may be ſafeſt, and beſt defended by the troupes, if an Enemy ſhould giue an attempt vpon them.

The waggons ought to be drawne vp, and ranged into eight, or ten rancks cloſe one to an other, that they may march without hindring one an other. and the Ordinance may march vpon one of the flankes of the Armie, and ſome Feild peeces before if neceſſity ſhould require, without hindring, or putting the reſt of the waggons into diſorder, which the Maſter of the Ordinance, or the Carriage Maſter, ought to Conſider well, and take a ſpeciall care of.

The Chiefe Officer, which Commaundeth the *Reereguard*, gives order that ſome Troups of light horſemen, ſhall march with in ſight of the whole *Reere*, eſpecially, when they are to paſſe over a Heath, or *Campagnie*: but the Countrie having mountaines, hils and vallies in yt, then the horſe may be commaunded to march ſometimes in the *Vantguard*, and ſometimes in the *Reere* of all the Armie, and keepe watch, and centinels vpon the higheſt places, that an Enemy may not diſcouver the ſtrength of the Armie, or in what order it marches.

When the armie is to march through ſome narrow paſſages, the *Vantguard* is commonly ſtrengthened with ſome foote, or Ordinance drawne vp before it, leſt an Enemie might ſurprize it, & marches then by files, and drawes vp as the condition of the place will permit. In like manner the *Reereguard* in places of danger, ought to be ſtrengthned, as alſo the *Battell* ranged into ſuch an order, that the Ordinance, and Baggage, being placed in the middeſt, may come beſt to ſerve, and relieve the other Troups, from whence they may ſend Harquebuſſiers (as occaſion ſerves) to attend both vpon the *Vantguard*, and the *Reere*, and as the ground will beſt afford.

In caſe that the waies and paſſages be ſo narrow, that the Ordinance, Carriages, and baggage takes vp ſo Much time, that the *Vantguard* cannot be eaſely ſeconded by the *Reereguard*, then there may be appointed ſome Troupes of *Reſerve*, which may march along with the Carriages, and Baggage, and be diſpoſed of in ſuch a ſort, that they may the better relieve thoſe Troupes which ſhould be overcharged by an Enemy.

Vpon ſuch an occaſion, one ought to conſider and obſerve well, the nature, and condition of that paſſage, through which the Armie is to march, whether there be any windings, and turnings in it, or other intricate waies, as through woods, hils and, vallies, where an Enemy may beſt lay his *Ambuſcadoes*: therefore vpon every ſuch turning, or croſſe way,

a troupe of horſe and ſome foote ought to be placed vpon it, to guard there, till the Ordinance, Carriage, and Baggage be paſt and out of danger.

How one is to march through a wood.

But in paſſing through a Forreſt, a great wood, or a Grove, there ought to be placed good ſtore of Horſe, vpon the waies that goes into it, and where the Armie is to paſſe, and to round and guard it well, aſwell on the one ſide, as on the other. And if there be any plaine, or open places in it, the Horſe are to overſpread it, and to draw there in Battaille for the ſecuring of the paſſage, till the Ordinance and Baggage be all paſt, and that the foote, and Horſe follow, which are appointed as a Reſerve to bring vp the Reere.

The Armie then, having paſſed through a wood, and come againe into a plaine *Campagnie* or Feild, ſome Horſe are to guard the way that comes out of the wood, till the Horſe troupes are drawn vp in thoſe Feilds, and are poſſeſſed of the heigths thereof.

How, and in what manner an Armie is to paſſe over a River.

When an Armie is to march through a Countrie, wherein there are Rivers and Brookes; The States Armie carries continually along with them ſome ten or twelve boates, having plancks Sparrs, Beames, anckors and Cables laden in them, and vpon thoſe *Block-waggons* that are drawne with ſome ten, or twelve couple of horſe, which comming to a river they preſently take them downe, caſts out their anckors, and laies them over the river, as broad as it is, & as many as they have vſe of, ioyning them together, laying the beames, plancks, ſparrs, & boards vpon them, and ſo in an inſtant, claps ouer a bridge, over which the Armie, Ordinance and Carriages may paſſe without danger. Sometimes alſo for expedition ſake, they lay over bundles of floate or flag bridges bound vp in Canvaſs, as alſo they make a bridge with Barrels, Hogsheads, in laying ſpars and planckes vpon them, being claſped and faſtned hard together: ſo that foote & horſe, and ſome ſmall Feild peeces may march over them.

A Bridge then (having good Inginiers, Carpenters, and workemen) is preſently made over a River, or a brook, for the ſecuring whereof there are certaine peeces of Ordinance, drawne vp, and planted by the river ſide, to play vpon an Ennemie, if they ſhould oppoſe the paſſage over it, and likewiſe drawes vp ſome *Harquebuſſers*, lighthorſemen, firelocks, and muskettiers, to give fire vpon an Enemie, while the bridg is a making. As ſoone as the bridg is layd over, ſome firelocks, halfepikes, and horſe marches firſt over it, to maintaine and make good the other ſide of the river, till all the Armie and carriage be come over, and takes alſo a long with them foure or fiue ſmall peeces of Ordinance, to ſcoure the paſſage, a waggon laden with powder, and amunition, and ſome Pionniers to make the waies, hedges, & ditches plaine, & expecting an Enemie at hand, commonly caſt vp a trench or a worke on both ſides of the bridge, having ſome 500 Souldiers to guard it, till the Armie and all the Carriages and Baggage be paſſed ouer it.

Now if an Enemie ſhould ſeeke to oppoſe, and hinder your paſſage over it, the Ordinance, horſe, and firelookes above mentioned are placed purpoſely vpon the Rivers ſide to free the paſſage, and to cleare the Coaſt.

FIRST,
OF THE ORDERING, AND FORMING
of a Deviſion, or a Battalion, and then the forme of an Army of thirty thouſand Horſe, and Foote raunged in Battell.

THe ordering of a Regiment, according to his highneſſe the *Prince of Orange* his commād, hath bin showne already in the firſt part of this book, namely, that Companies being made into even files, and ten deepe. foure, or five Companies, ioyned together make a diviſion, to wit, the Pikes are drawne firſt into one bodie, and then the Muskettiers into an other, ſtanding in their true diſtance of there foote in file & Ranke, and 18 foote diſtance betweene the Pikes and the Muskettiers, this is the firſt order. The ſecond is, when th: Muskettiers are equally devided, as neere as may be, and drawne vp on the right, and left flankes of the pikes, there to giue fire by Rankes, or to march away, as theſe two firſt figures marked wth number 1 and 2 doe shew.

Now the fitteſt number of men to make a deviſion of, is accounted to be 500 Pikes, and Musketteires, that is, 25 files of Pikes, and 25 files of Musketteires, or more, or leſſe of the one or of the other, as they fall out.

This number being ſo embattailled makes an *Agile* bodie, and the beſt to be brought to fight, and two of them being ioyned neere one an other, can beſt ſecond, and releiue each other, better then your great *Phalanges*, which are unweeldy bodies, the experience whereof was ſeene in the Battell of *Nieuport*: for being once broken, and routed, they can hardly be reallyed againe, and cannot bring ſo many men to Fight, as the Leſſer Bodies doe.

Many of theſe Deviſions being drawne together make a *Tercia*, *or one of the third parts of an Armie*, and three of them the whole.

For all the Officers and Souldiers of an Army, are devided into three parts called *Brigadoes*, or *Tercias*, each of them having a ſeverall name, to witt, the *Vantguard*, *the Battel* & the *Reereguard*.

Now that Tercia, which is to march firſt, is called the *Vantguard*, that which marches in the midſt the *Battaile*, and that which comes vp laſt the *Reere*. Everie one of them vpon a march euery day takeing their turnes interchangeably: for the ſecond day of the march, the *Battaile* becomes the *Vantguard*, and the *Reere* the ſecond day hath the *Battaile*, and the third day the *Tercia* which had the *Reere* the firſt day is the *Vantguard*.

Moreover, each *Tercia* may likewiſe be ſubdivided into a *Vantguard* a *Battaile* & *a Reere*, to the end each of them with the more convenience may be orderly brought to fight, and by that *Cheiſe*, which commaunds them.

Therefore, the *Battaill* one of the *Tercias* of the Army, being placed in the midſt, that of the *Vantguard*, may be drawne on the right, and the Reere on the left flanke of the *Battaile*.

Now the number of the deviſions, which each of theſe *Tercias* haue, are ordered, and devided after this manner, two deuiſions before, two in the midſt, and two behind, ſtanding aboue, as you may ſee in ſome of the figures of the Battells following, having ſix or 7 deviſions placed in euerie *Tercia*. The ſeventh being vneven, is placed as a Reſerue behind the Reere, to ſecond the others in time of neede.

The firſt deviſions of the *Tercias* ſtanding in a right line, are to give the firſt *charge*, according to the order of their *March*.

The ſecond deviſions ſtanding likewiſe in a right line, makes likewiſe the ſecond troupes and the third part of the *Battaile*.

Now theſe deviſions are ſo ordered and ioyned, that if the firſt should be overcharged and come to giue ground, then the ſecond are to come vp, and to releiue the firſt, yet in ſuch a diſtance, as they may not hinder one an other in marching by them, but finde place to come vp betwixt the firſt.

The third deviſions are to be placed directly behind the ſecōd, in a diſtance twiſe as much

as the ſecond is from the firſt, that if it ſhould happen, that the firſt diviſion ſhould ſtand behind the ſecond, that then the third might have roome enough, to put it ſelf into good order.

The Horſe Troupes are commonly ordered, the one halfe on the right, the other halfe on the left flanke of the diviſions, and Battaillons of foote, as the firſt figure of an Armie demonſtrates.

And ſometimes there may be *Battaillions* of Horſe interlaced, and placed betwixt the *intervals*, and diſtances of the Foote, as the ground and neceſſity may require. For, if an Enemies Horſe ſhould be ranged betweene his *Battaillions* of foote, it is needefull then, that the other ſide ſhould obſerve the ſame forme likewiſe, and have horſe to encounter horſe, leaſt they ſhould breake in vpon the foote diviſions, and ſo by this meanes they may with the more convenience ſecond, and relieve one an other, otherwiſe the Foote being overlayd with an Enemies Horſe, having not Horſe at hand, to charge and ſecond them, might be caſely routed and overthrowne, and though and Enemie have not placed Horſe betweene their *battailions* of foote, yet it may eaſely be done, according to the diſcretion and foreſight of the Generall. All which ſhalbe clearly demonſtrated to the Eye by figure firſt in beginning with an Army of ſix thouſand Horſe, and 24 thowſand foote embattailed into three Tercias, with their ſeuerall diviſions, and afterward I will show the grounds and platformes of the Battaile of *Nieuport in Flanders*, fought (Anno 1600) betweene *Prince Maurice* of famous memorie, *& Albert Arch Duke of Auſtria*, and then proceede on to repreſent vnto you the formes of Battailes shown by the Prince of *Orange* abouesaid, & his highneſſe brother the Prince of Orange that now is till Anno 1635, which may giue ſome ſatisfaction to thoſe, which are deſirous to follow the profeſſion of a Souldier.

The Demonſtration of the figures following, marked with great A. and B.

The two firſt figures, marked with the figure 1 and 1 are two Diviſions of 25 files of pikes a peece, and ten rankes deepe, ranged in Battaille.

The ſecond two figures noted 2. and 2. are two Diviſions of muskettiers, conſiſting alſo of 25 files a peece, and 10 Rankes deepe as aboveſaid.

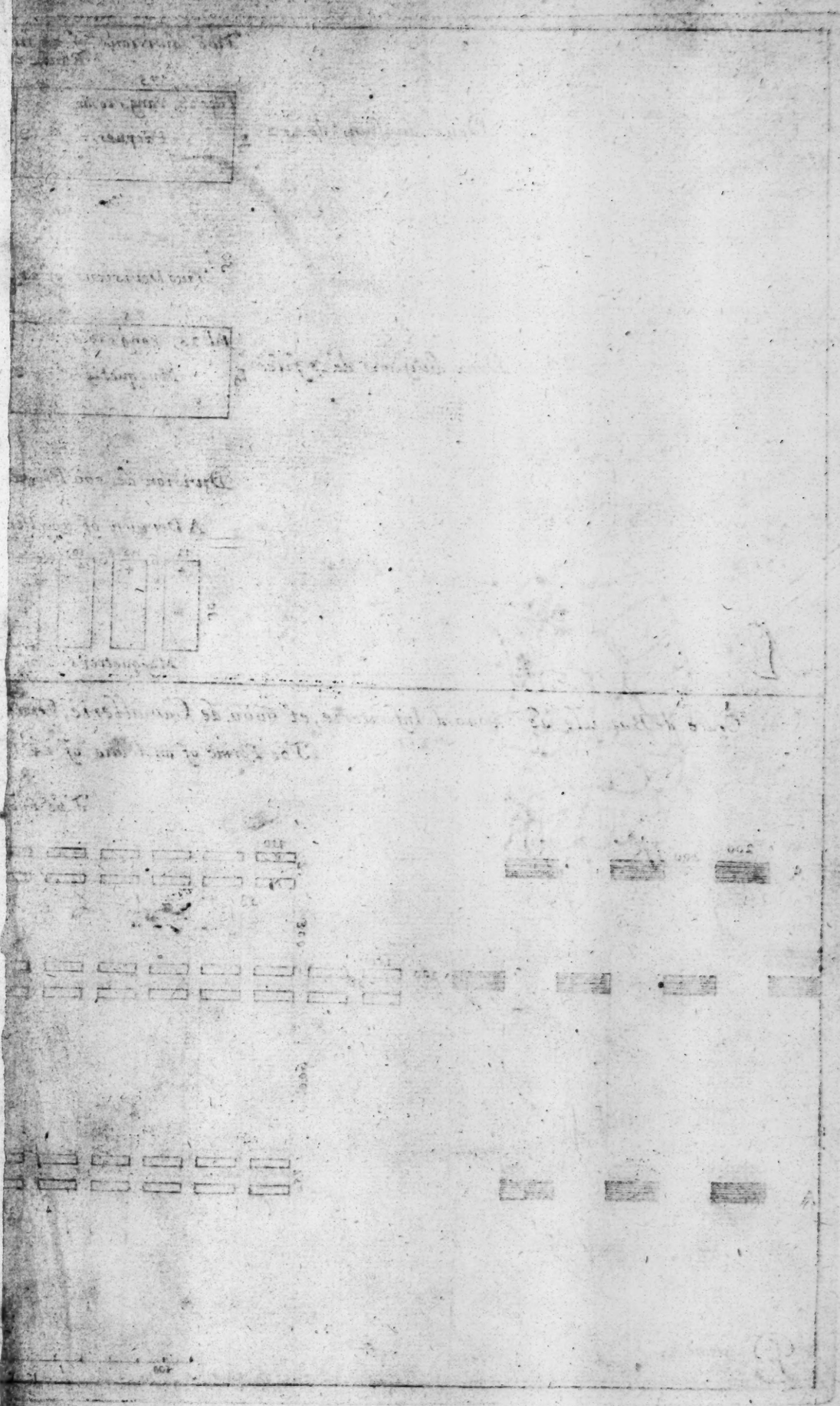
Now if you are deſirous to alter this forme, and divide your Musketters into two parts, then you may draw vp 13 files on the right flanke, and 12 files on the left flanke of the Pikes, and giving them their true In tervals *and diſtances for the Muskettiers to fall away, then there are two diviſions made of a Regiment, and they ſtand as is shewed vnderneath, marked with the the figure 3.*

The figure B *repreſents the forme of an Armie embattailed, conſiſting of 24 Regiments of foote, each Regiment making two diviſions of 1000 men, and 20 diviſions of Horſe Curaſſiers, and Harquebuſiers, each diviſion conſiſting of 300 Horſe, making ſix thouſand Horſe in all ranged into three Tercias, with the true number of feete, and diſtances betweene them, as the figures showes.*

Note alſo, where the gentle Reader ſees a P marked within the Deviſion, that ſignifies Pikes, and the deviſion underneath are muskettеirs marked with the Letter M.

To conclude, the Horſe are noted in French with C for Cavallerie, and in English with H for Horſe.

The figures that are Coloured are diſtinguished thus. The Pikes with a yellow, the Muskeeirs with a green, and the Horſe with a red colour.



Lot 18

Two divisions of 25 files of Pikes
Ranke & file making

Deux divisions de 25 = 75. Files 25, rangs 10. de Picpues. 30. 10. = files de Picq

50.

Two Devisions of 25 files of Musk

Deux divisions de 25 files 75. Fil. 25; rangs 10 de Musquetiers. 30. 10. de Musquetair

50.

Division de 500 Picques et Msquet

A Devision of 500 Pikes et Mskettie

12. 6 12. 6 12. 6 — 30. — Musquetiers. — Picques.

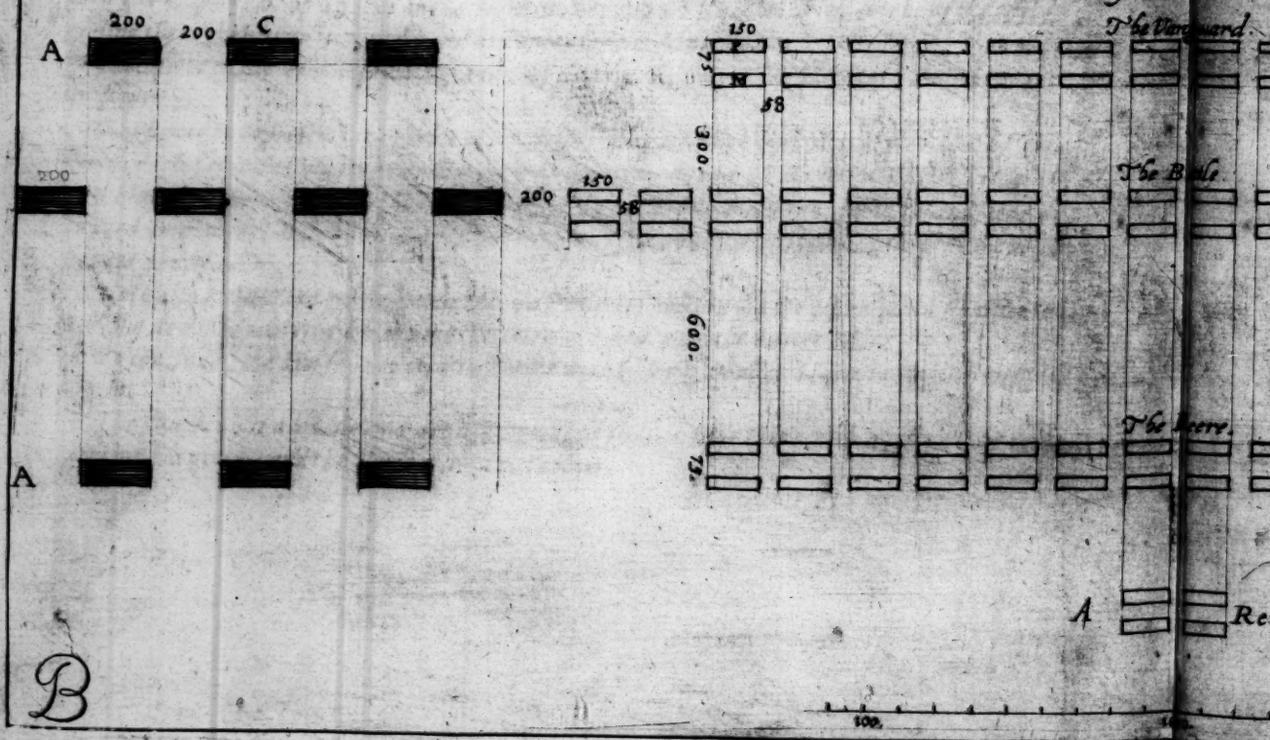
A

Ordre de Bataille de 24000. d'Infanterie, et 6000. de Cavaillerie, Ordonné en trois

The Forme of an Armie of 24 Thousand Foote

Brigades or Tercio

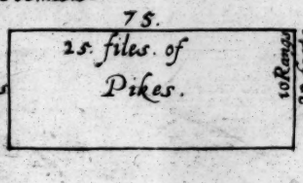
The Front from A to B is



B

100.

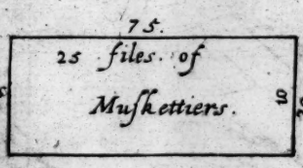
Pikes standing in their order in making 500 men.



e Picques mis en Ordre.

50.

Muskettiers making 500 men.

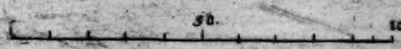


quetaires faisant 500 hommes.

quetiers en Bataille.

skettiers embattailed.

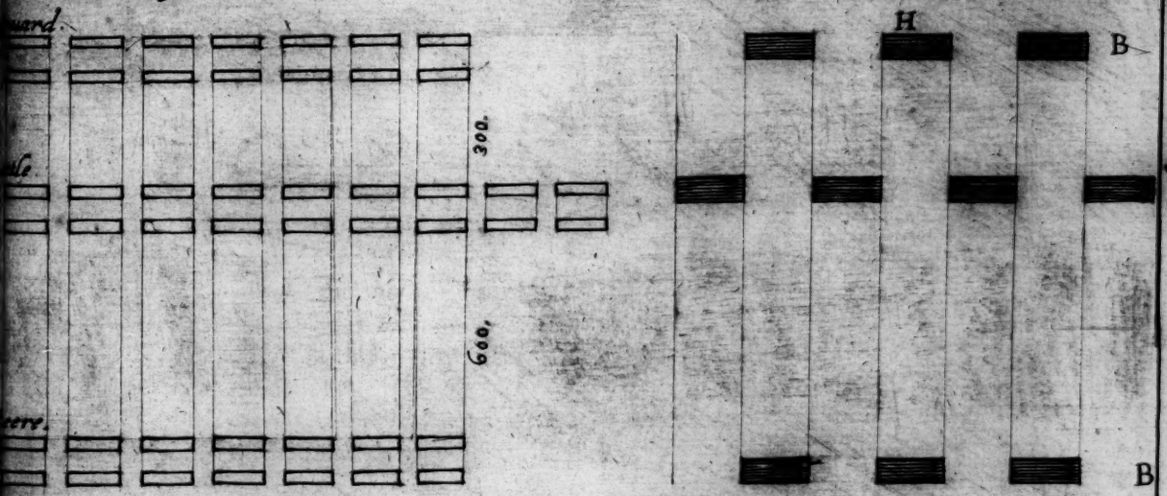
ues. Muskettiers.



rois Brigades, duquel le Front de A. B. á 5054. pieds.

Foote & 6000 Horse, ranged into three Tercias.

to B is 5054 foote.



uard.

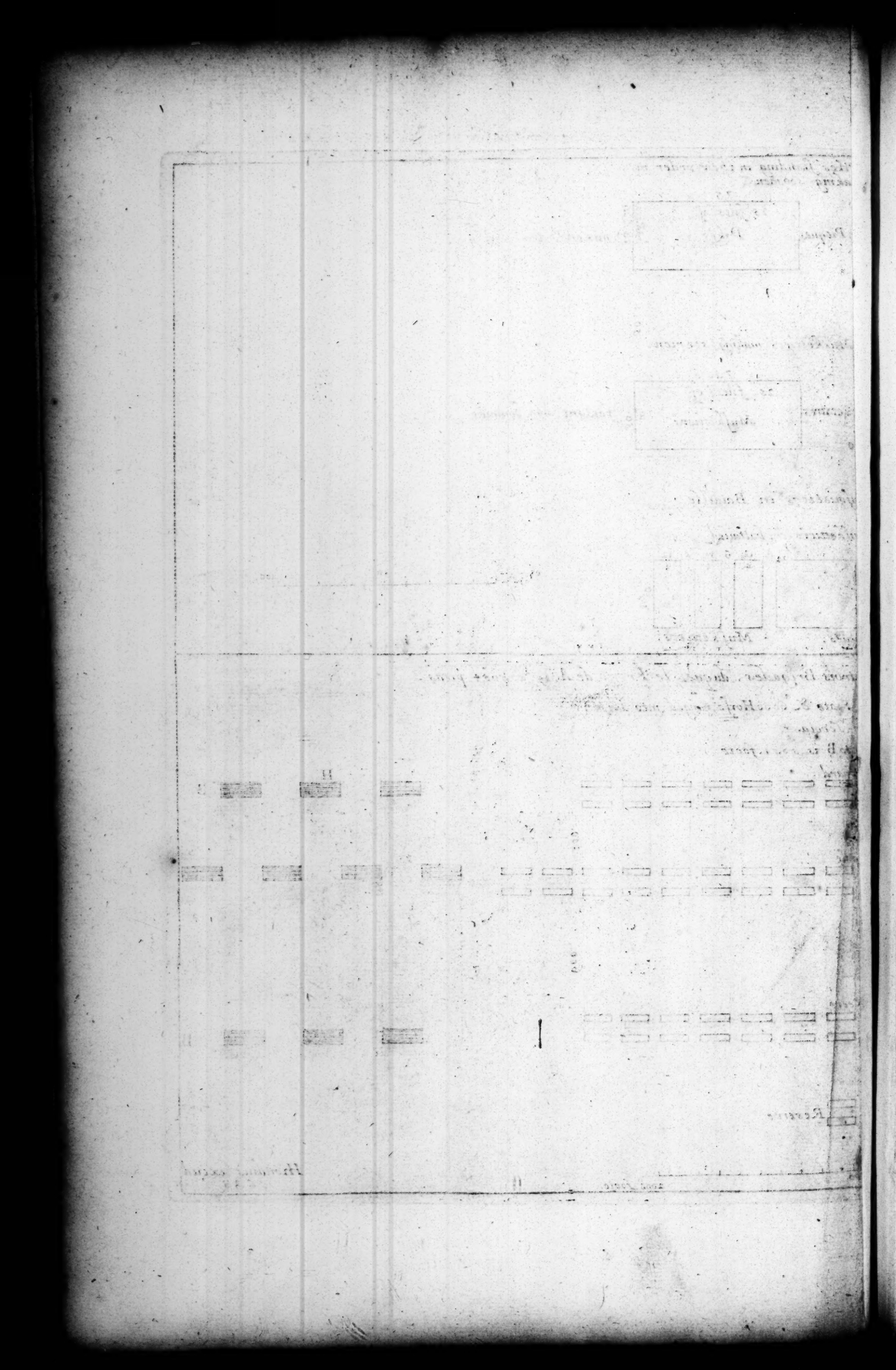
ile

rere.

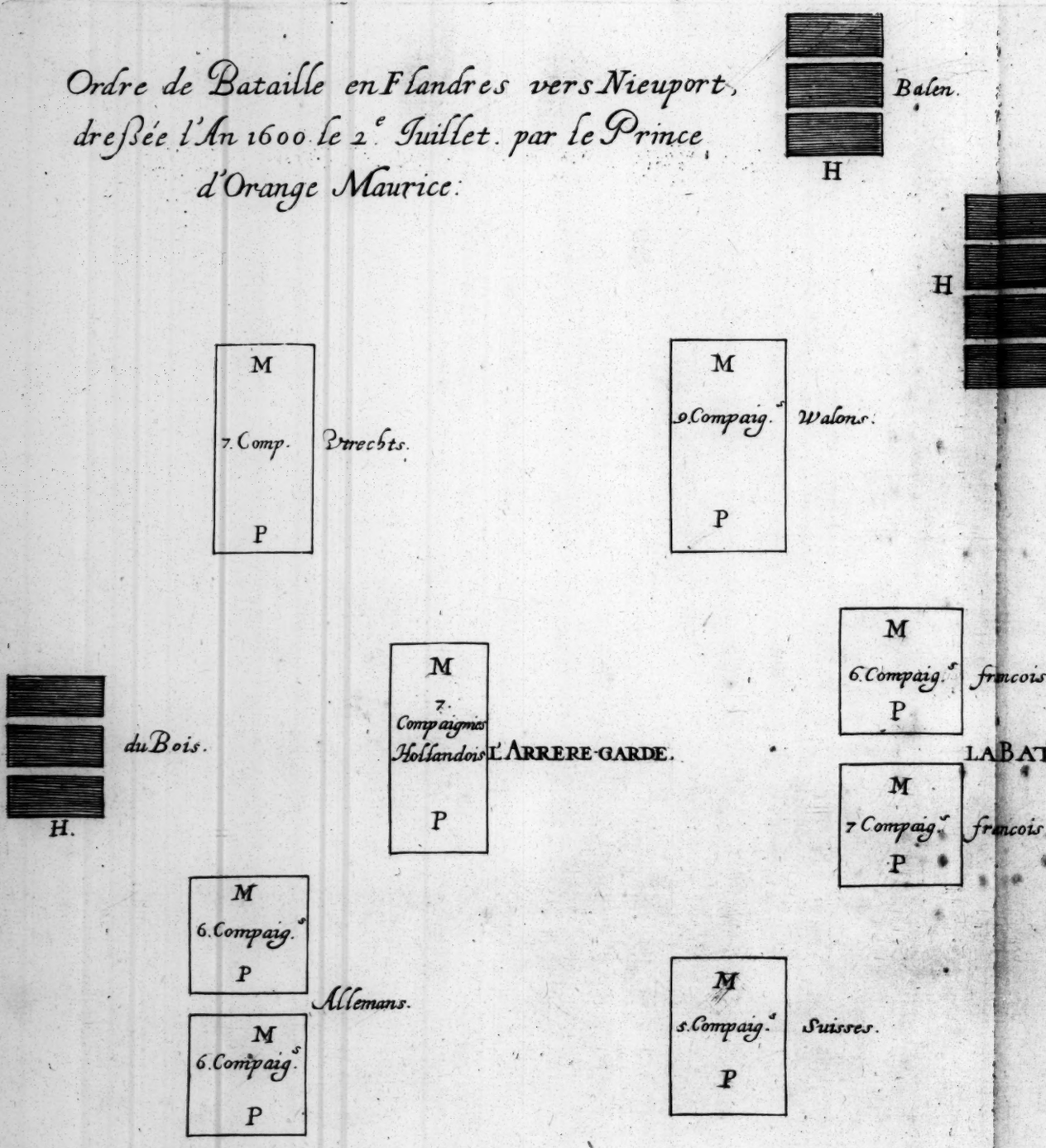
Reserve

2000 foote.

Hondius excud 1638.

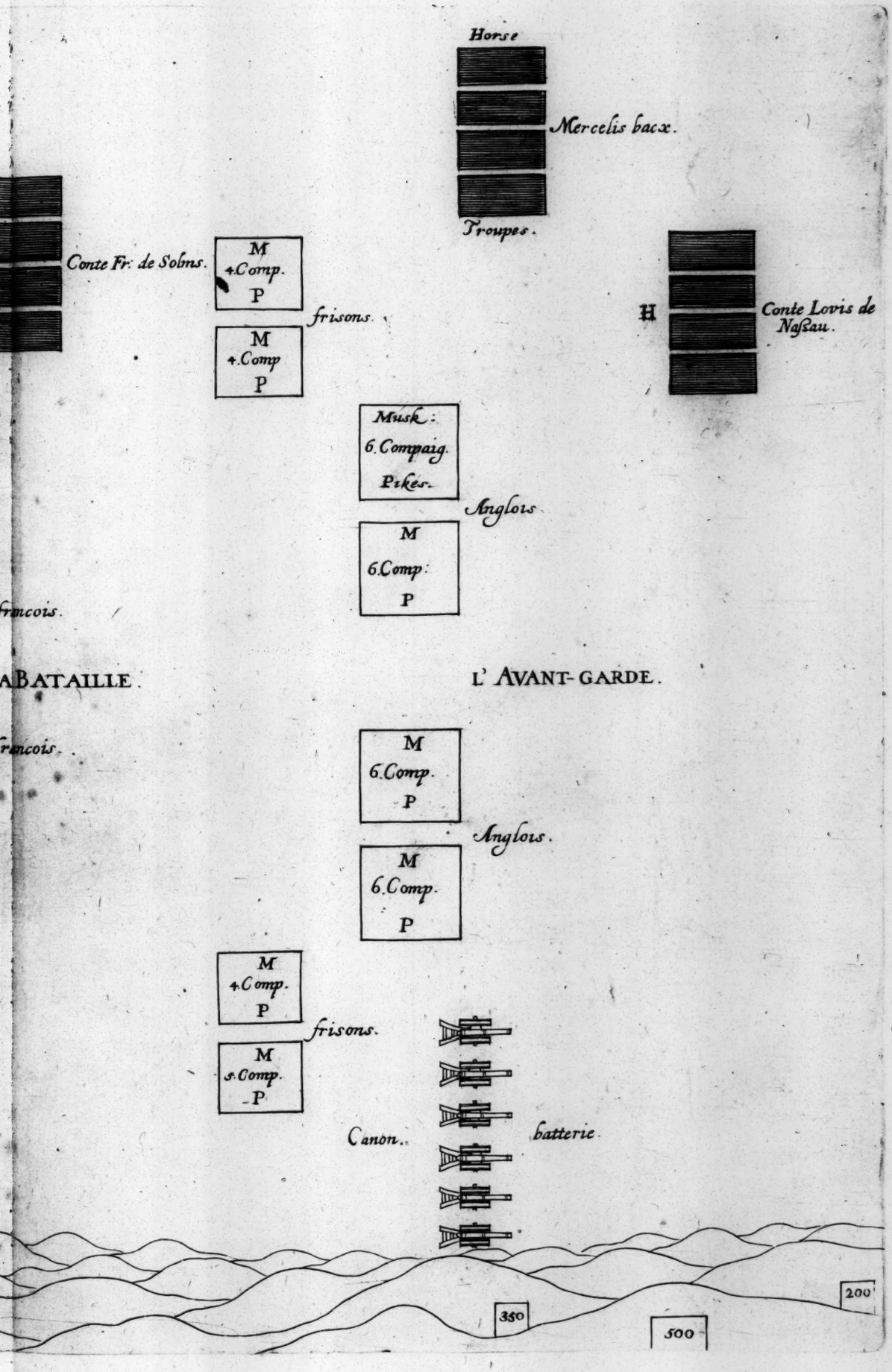


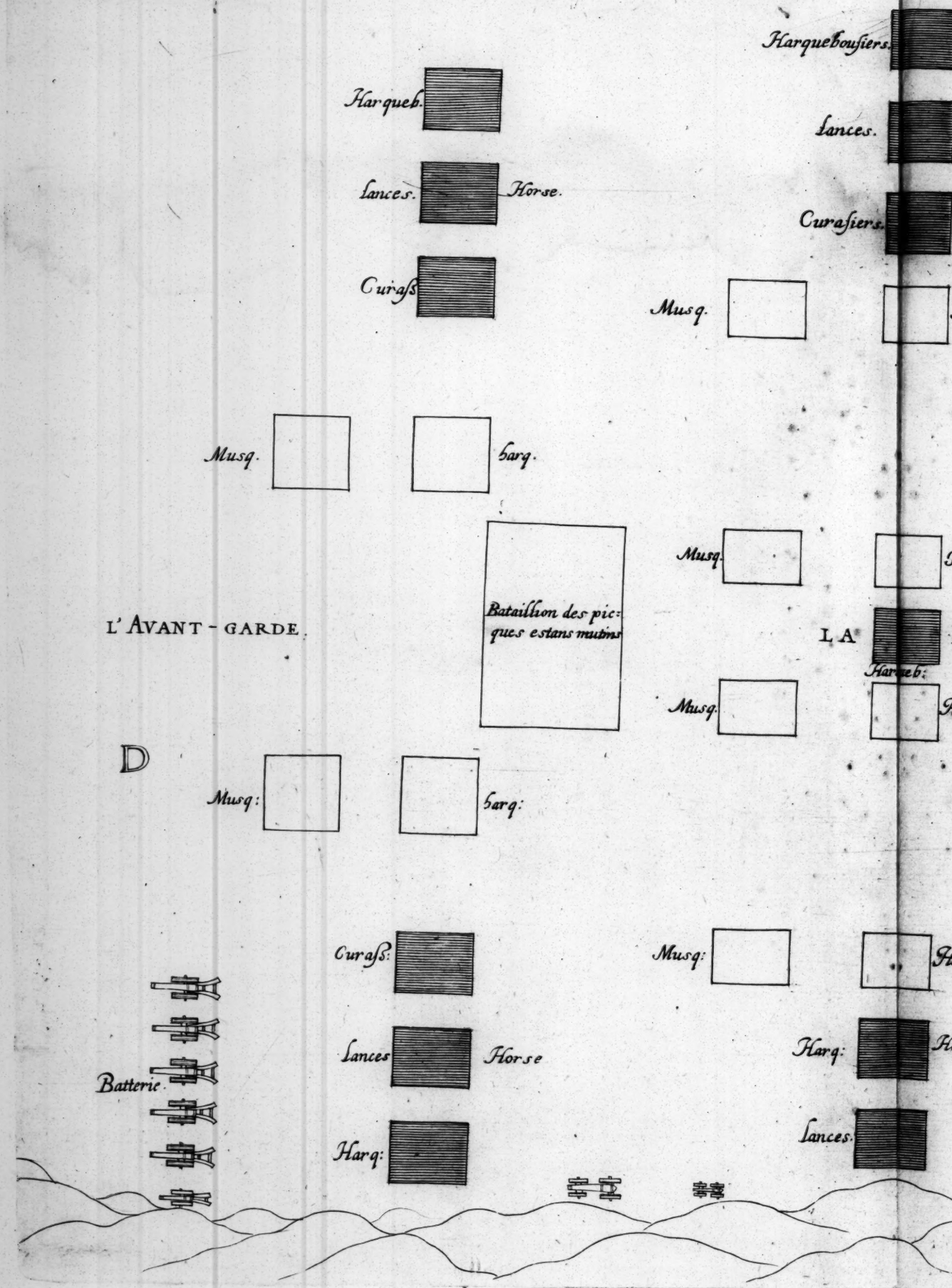
Ordre de Bataille en Flandres vers Nieuport, dressée l'An 1600 le 2.e Juillet. par le Prince d'Orange Maurice.



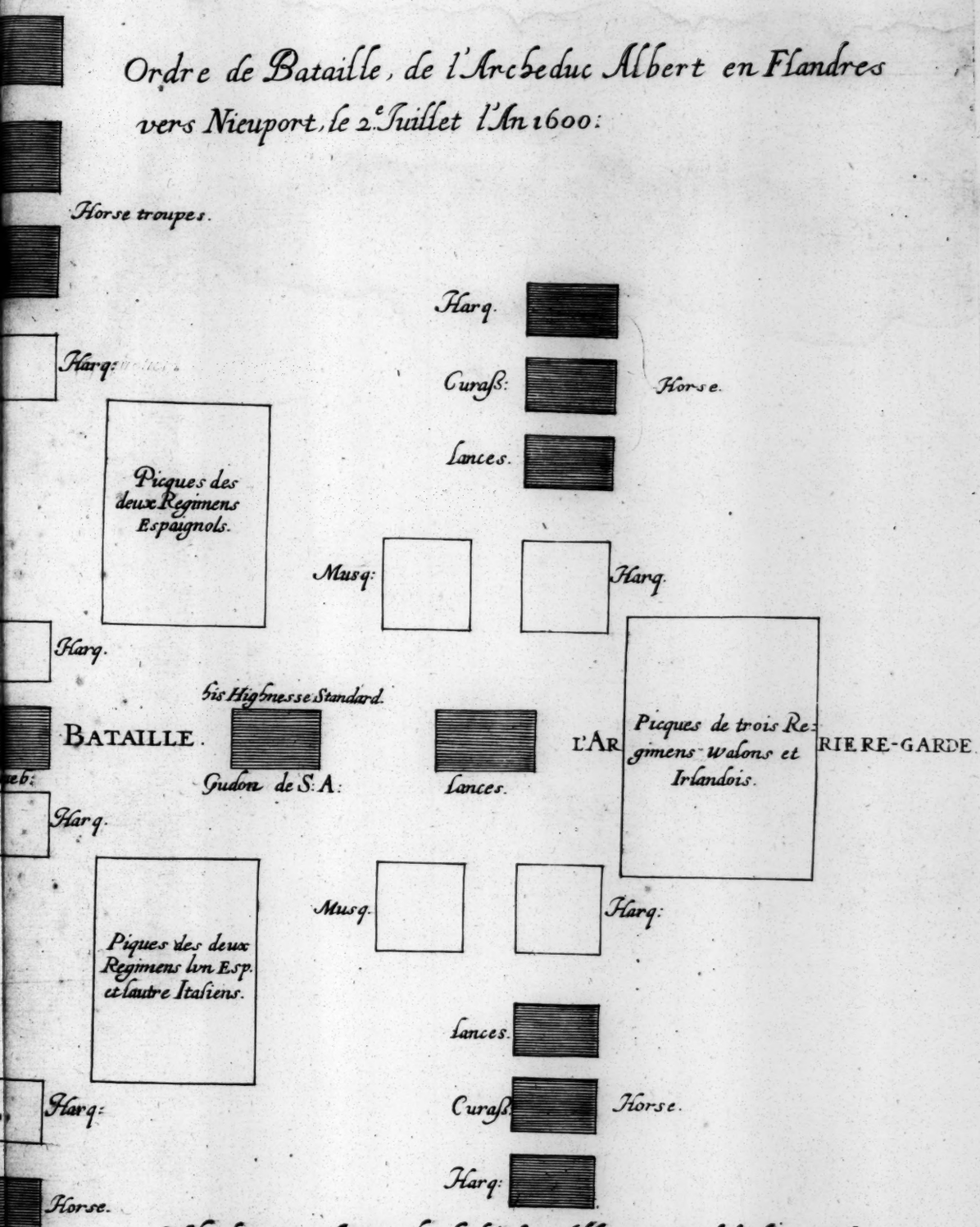
The forme of the Battle of Nieuport in flanders ordered, fought and wonne the second of July anno 1600. by Maurice Prince of Orange.

C

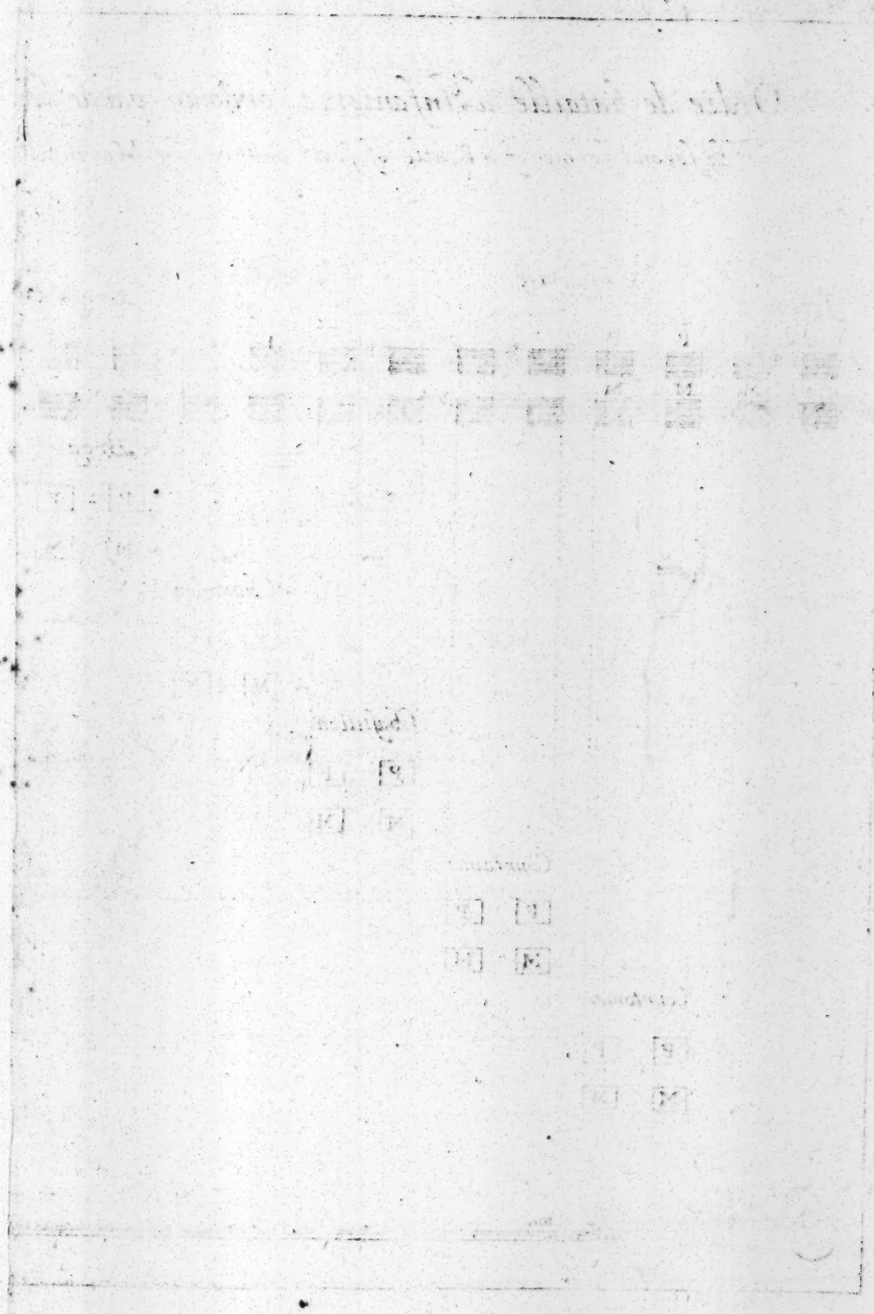

Horse
Mercelis bacx.
Troupes.
Conte Fr: de Solms.
M
4. Comp.
P
frisons.
M
4. Comp
P
H
Conte Lovis de Nassau.
Musk:
6. Compaig.
Pikes.
Anglois
M
6. Comp.
P
rancois.
A BATAILLE.
L' AVANT-GARDE.
rancois.
M
6. Comp.
P
Anglois.
M
6. Comp.
P
M
4. Comp.
P
frisons.
M
5. Comp.
P
Canon.
batterie
200
350
500


Harqueb.
Lances.
Horse.
Curaſs.
Musq.
Harq.
L'AVANT-GARDE.
Bataillion des pic-
ques estans mutins
D
Musq:
Harq:
Curaſs:
Lances
Horse
Harq:
Batterie.
Harquebouſiers.
Lances.
Curaſiers.
Musq.
Musq.
Musq.
LA
Musq:
Lances.

Ordre de Bataille, de l'Archeduc Albert en Flandres vers Nieuport, le 2.e Iuillet l'An 1600:

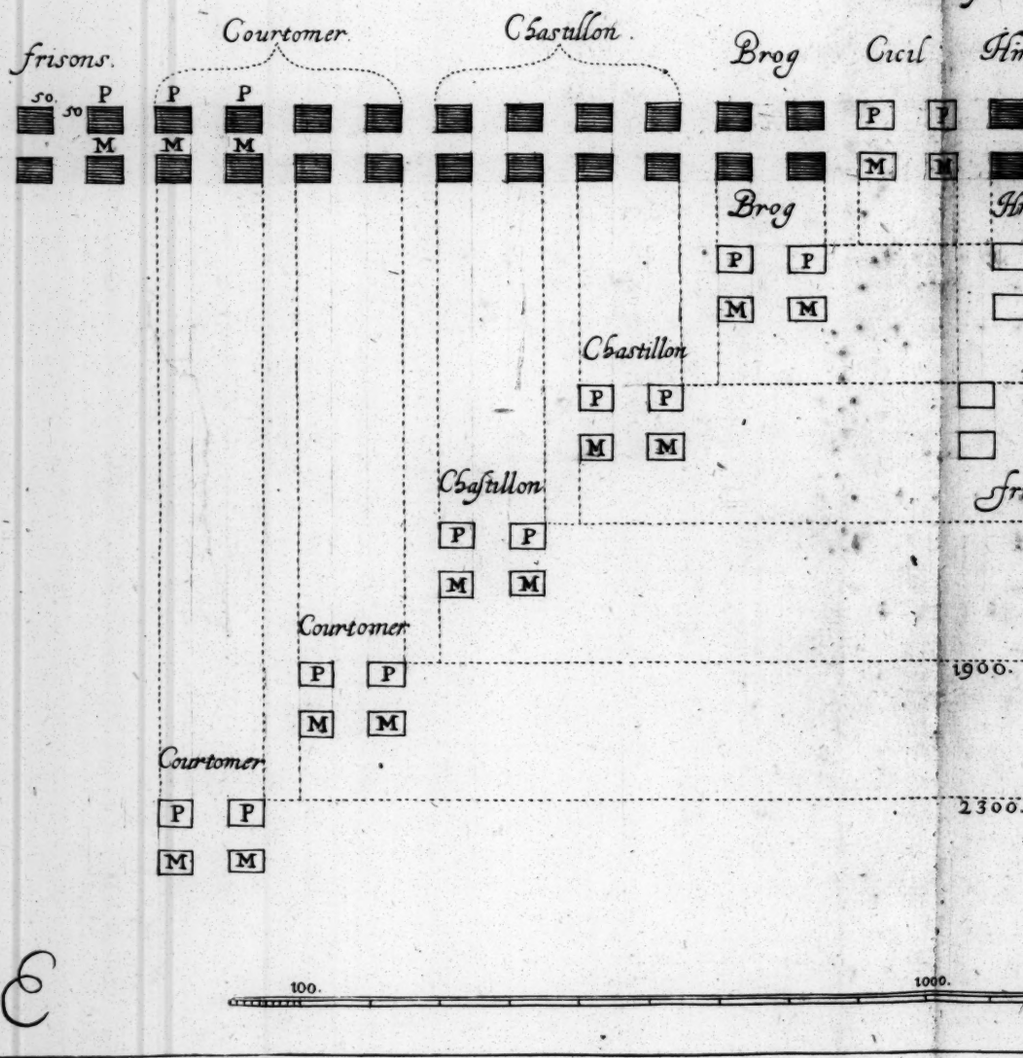


The forme of Battle held by Albert Archduke of Austria neere vnto Nieuport in Flanders the second of Iuly anno 1602.



Ordre de bataille d'Infanterie, ordonné par le feu Prince d

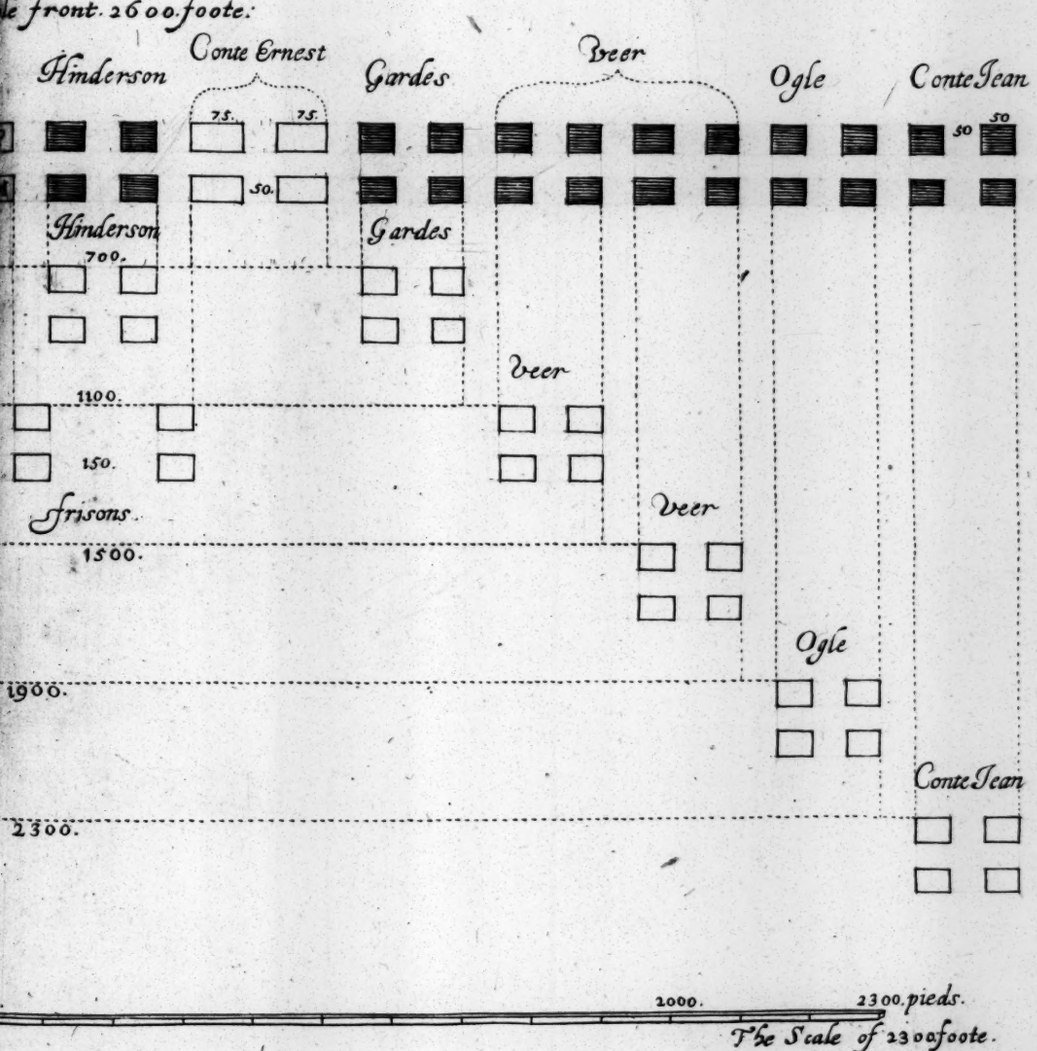
The second forme of a Battle of foote ordered by Maurice Prince of Orange



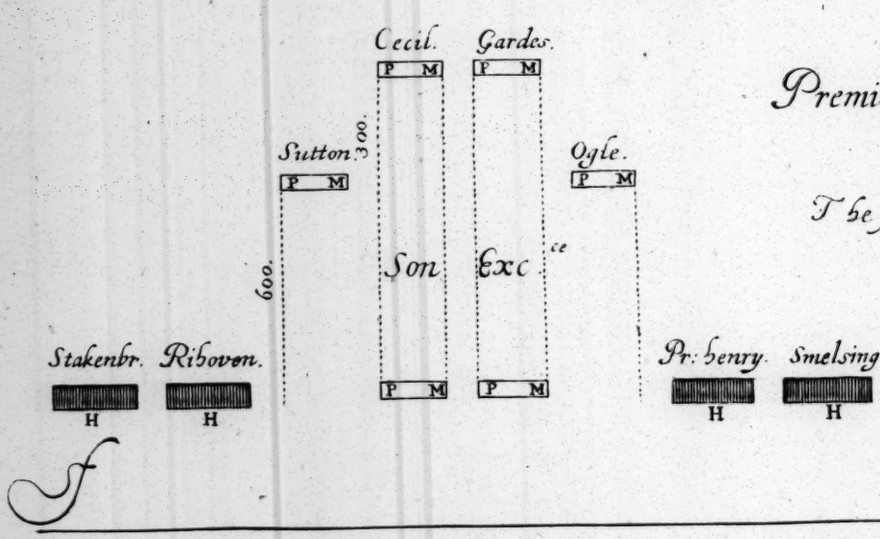
nce d'Orange Maurice, de tres-haute memoire. l'An 1605.

Orange of famous memorie before Rees Anno 1605.

le front. 2600. foote.



The Scale of 2300 foote.



Premiere forme de l'Ordre de Ba

le 23.e Septembre 1605

The first forme of the order of Bat

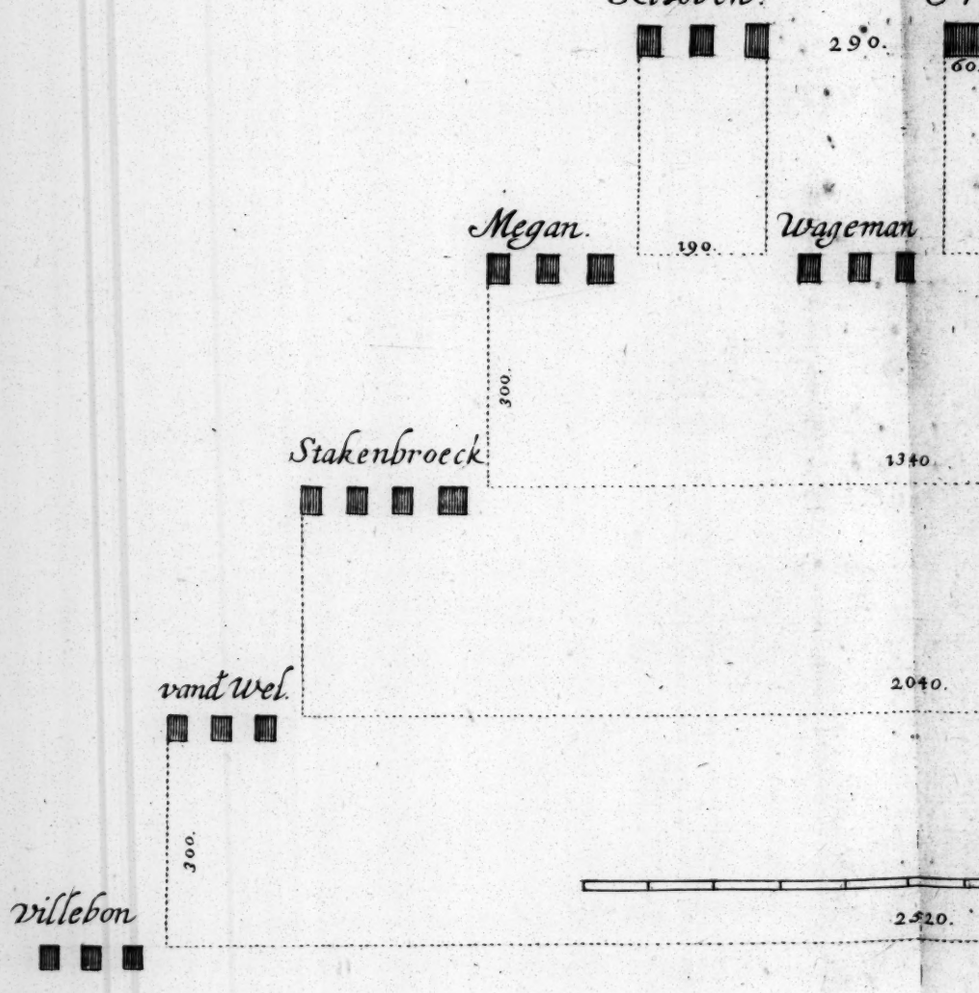
September 1605.

The scale of 1000 f

Ordre de Bataille de 37. Compaignies de Cavail

Tout le front est de 30

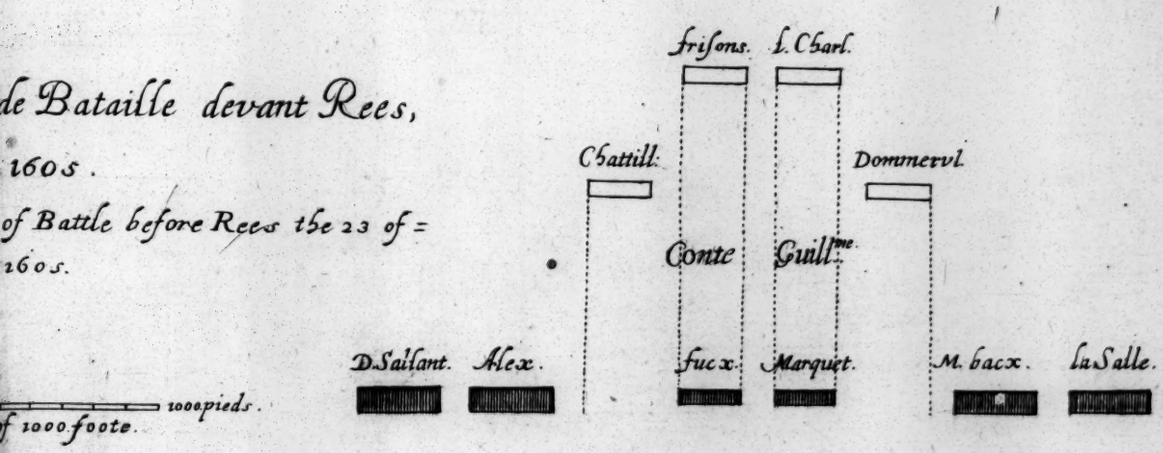
The Order of Embattailing 37. troupes of Horse before Rees the 23. of Sep



de Bataille devant Rees,

1605.

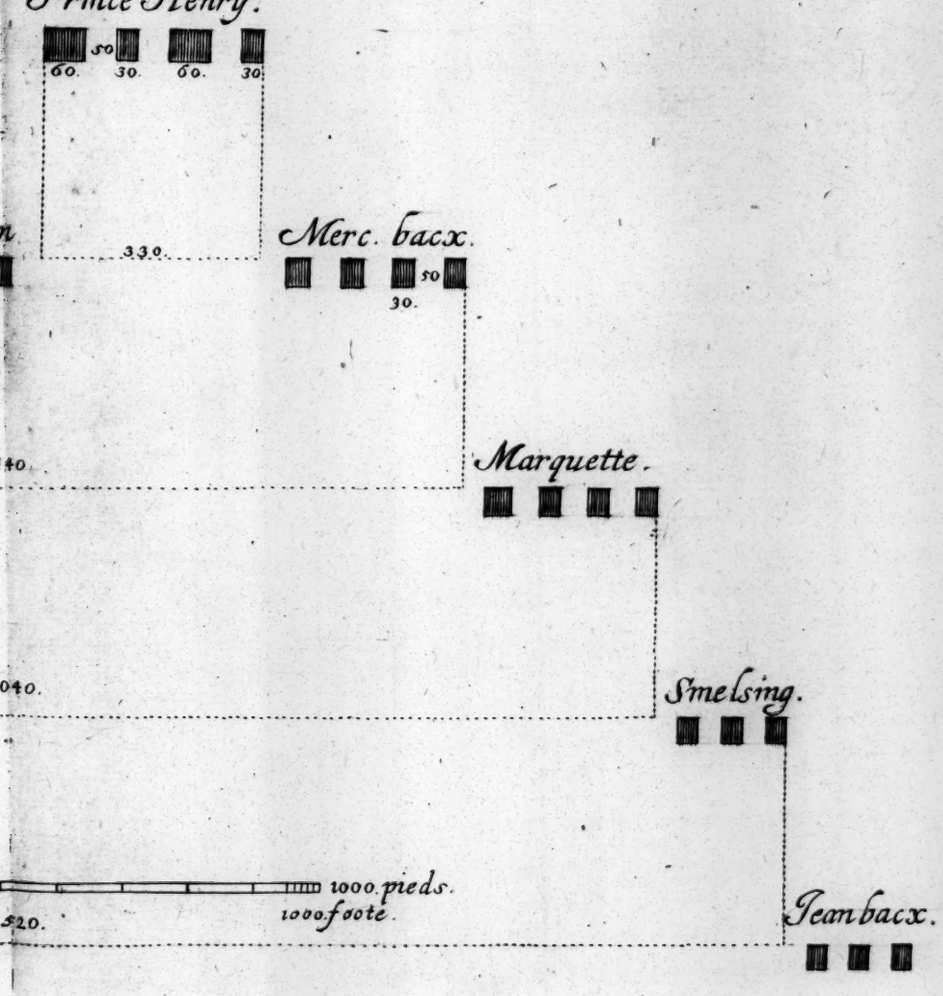
of Battle before Rees the 23 of =
1605.



Cavallerie devant Rees, le 23. Septemb. 1614.

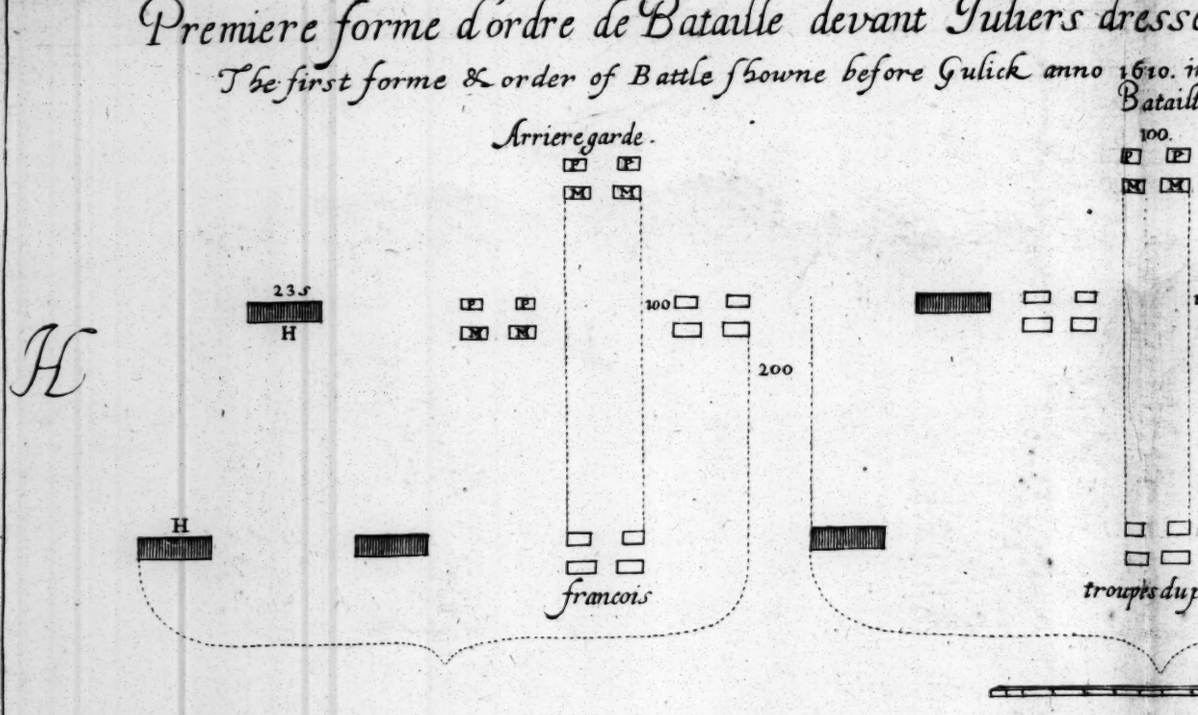
le 3000 pieds.

of September 1614. the whole front is 3000. foote.



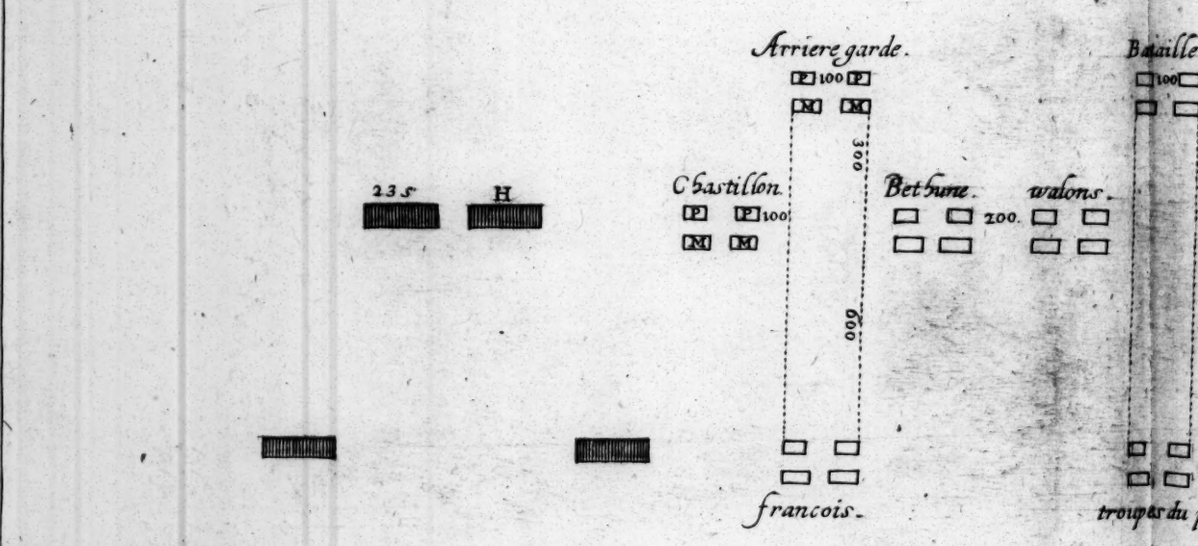
Premiere forme d'ordre de Bataille devant Iuliers dresse

The first forme & order of Battle shoune before Gulick anno 1610. i



Seconde forme de lordre de Bataille dressée. depuis V

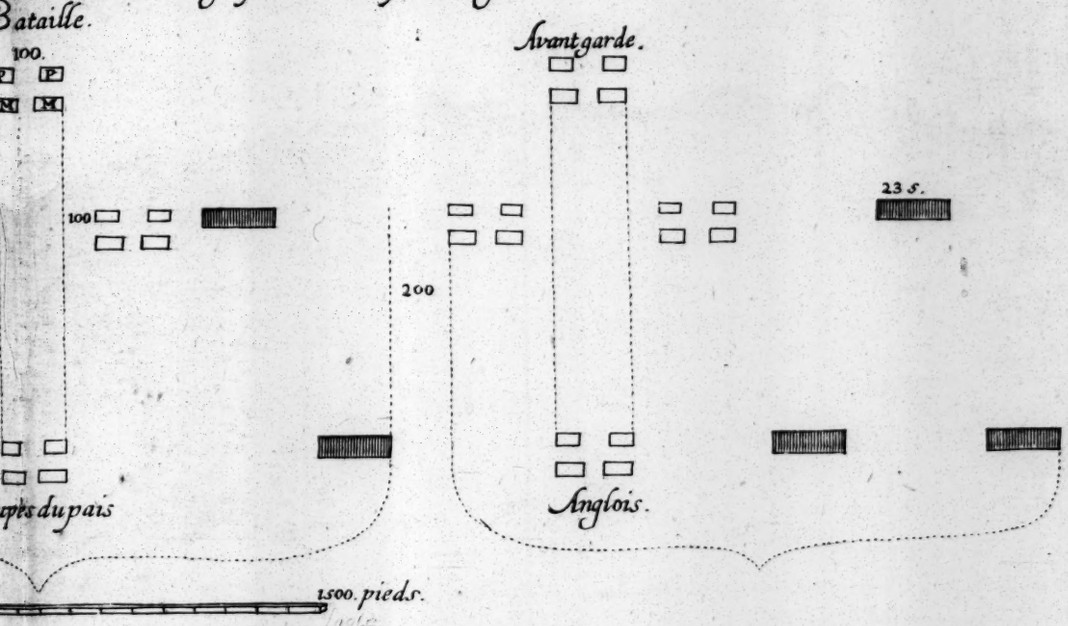
The second forme of Battle shoune in marching from Vorstenberg tou



J

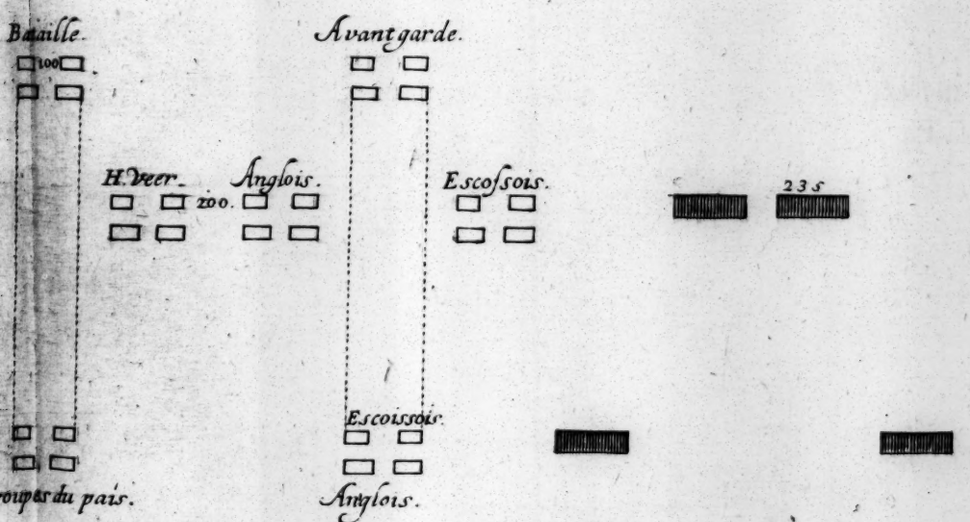
ressée l'an 1610. en marchant depuis Vorstenberg.

610. in marching from Vorstenberg.



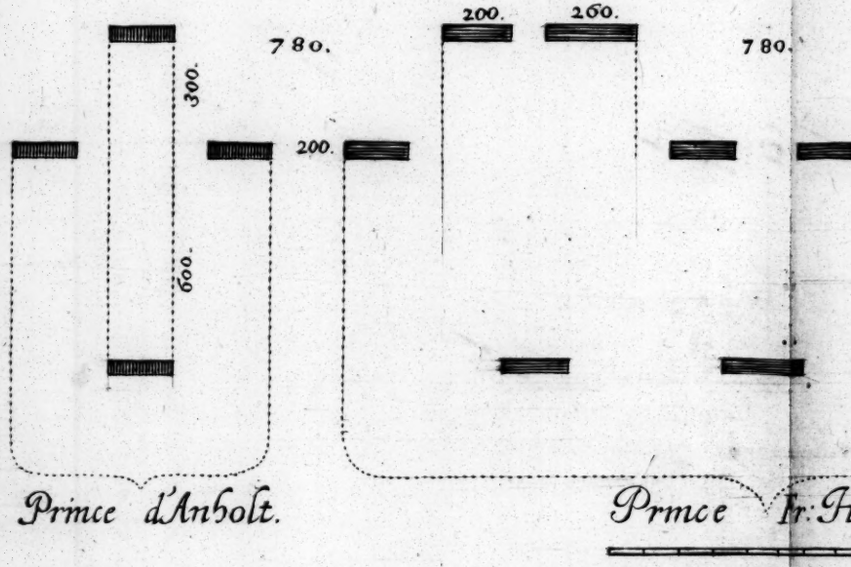
uis Vorstenberg vers Juliers, le 22e Aoeust 1610.

erg towards Gulick, the 22. of August 1610.



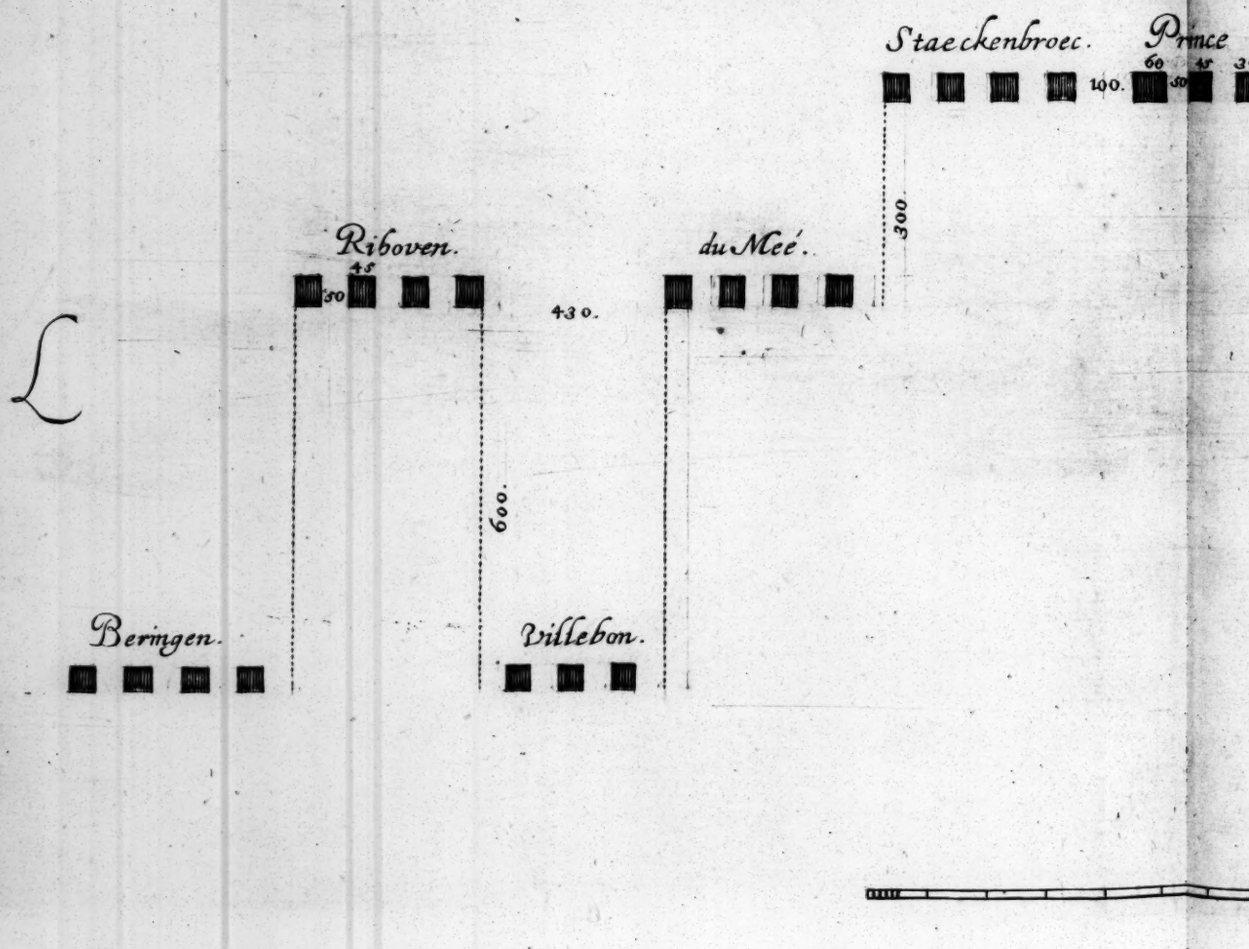
A Forme of Horse Embattailed before G
Ordre de Bataille de Cavaillerie devant Iulier.

K

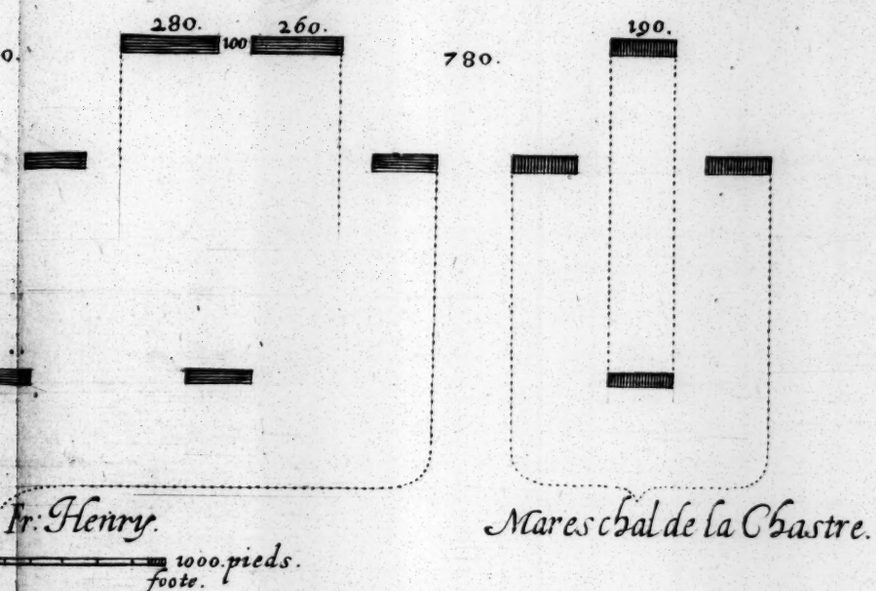


An otherforme of Embattailing Horse sho
Ordre de Bataille de Cavaillerie devant Re

L



fore Gulick Anno 1610.
Juliers l'An mille sixcent et dix :



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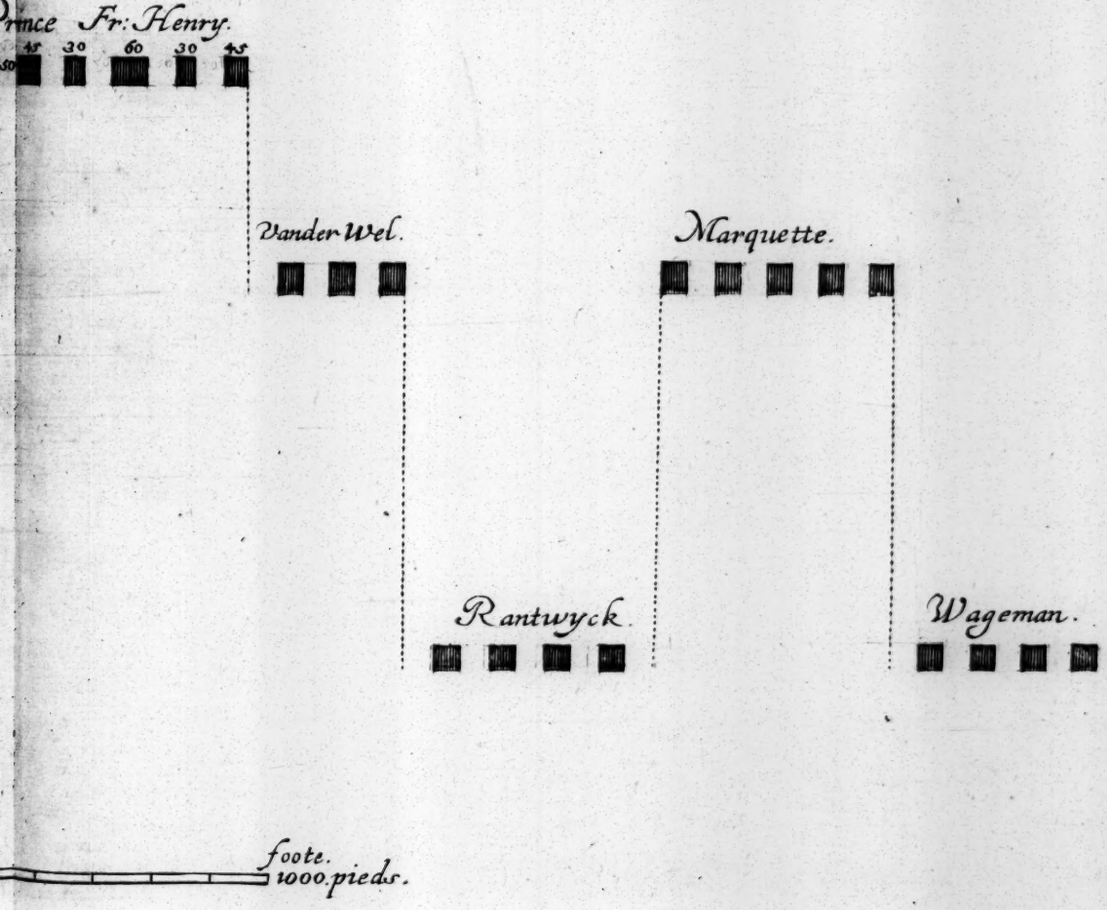
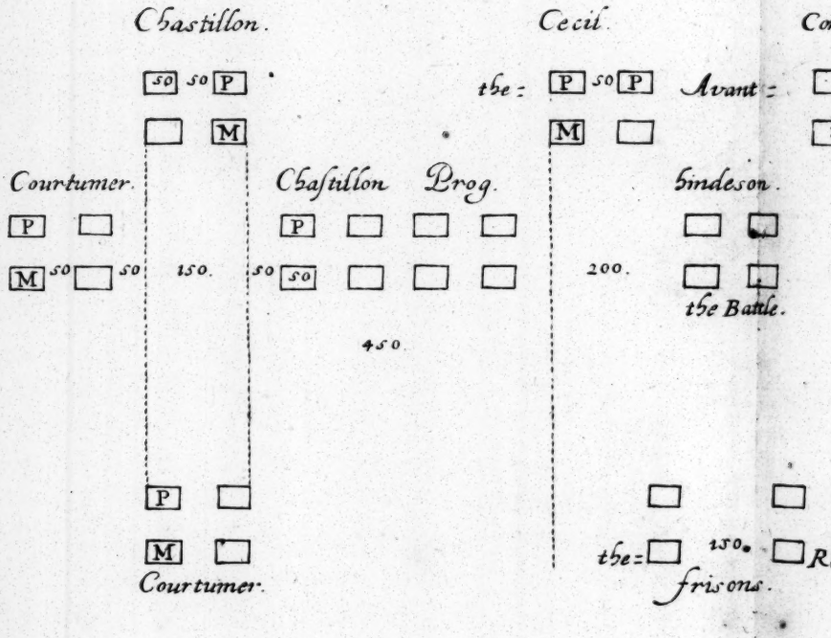
e shoune before Rees by his Ex.ce 1621.
nt Rees, ordonné par son Exc.ce en octob: 1621.



Ordre d'Infanterie en bataille devant Re
long 2200 pieds, et la hauteur

The forme of a Battle of Foote shoune befe

The whole Front is 2200 foote. & the depth

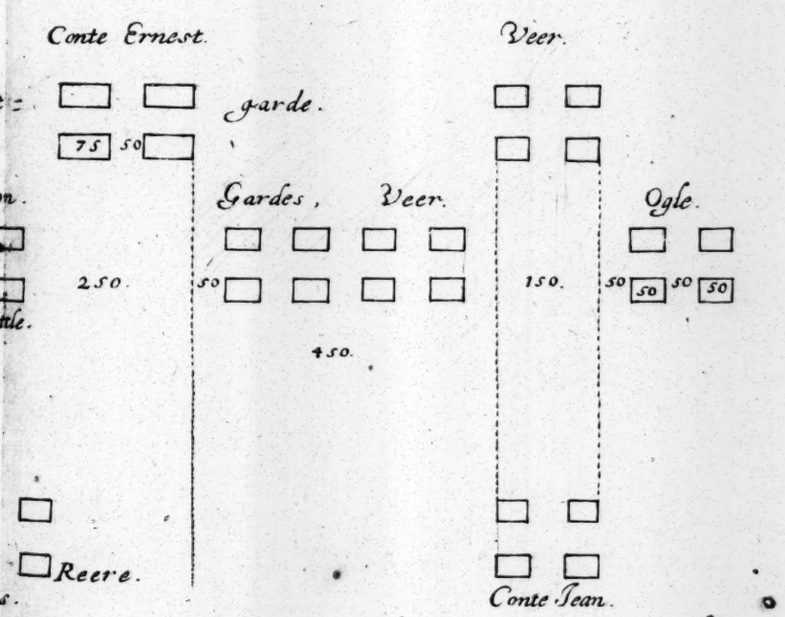


M

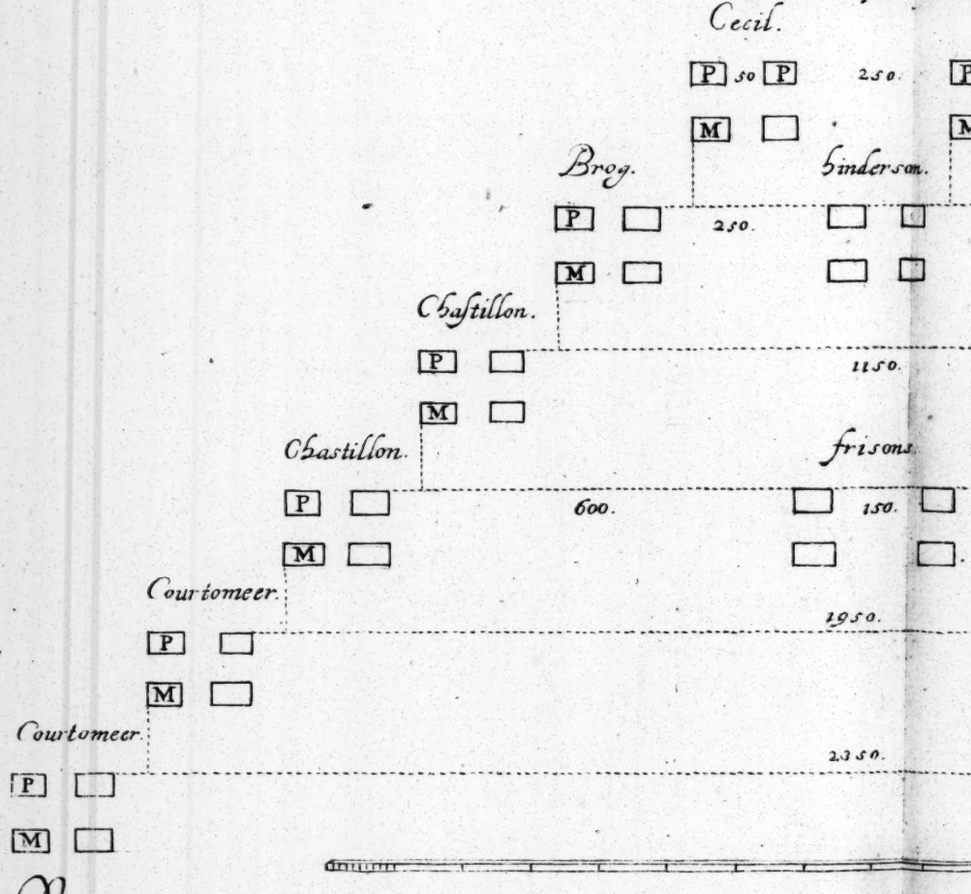
t Rees L'An 1614 duquel le front est :
nuteur 740 pieds.

e befere Rees Anno 1614.

depth 740. foote.

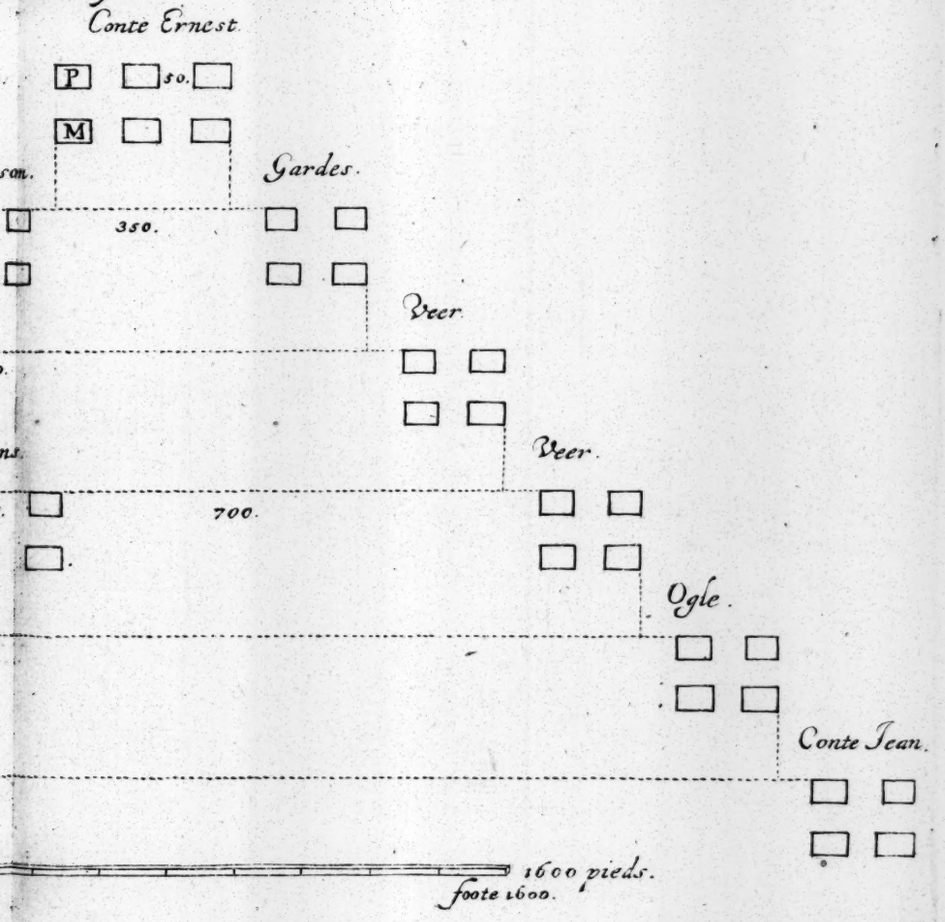


Autre Ordre d'Infanterie en Bataille devant
long 2750. pieds, et la ba
An other forme of Embattail. foote showne before
& the depth 116



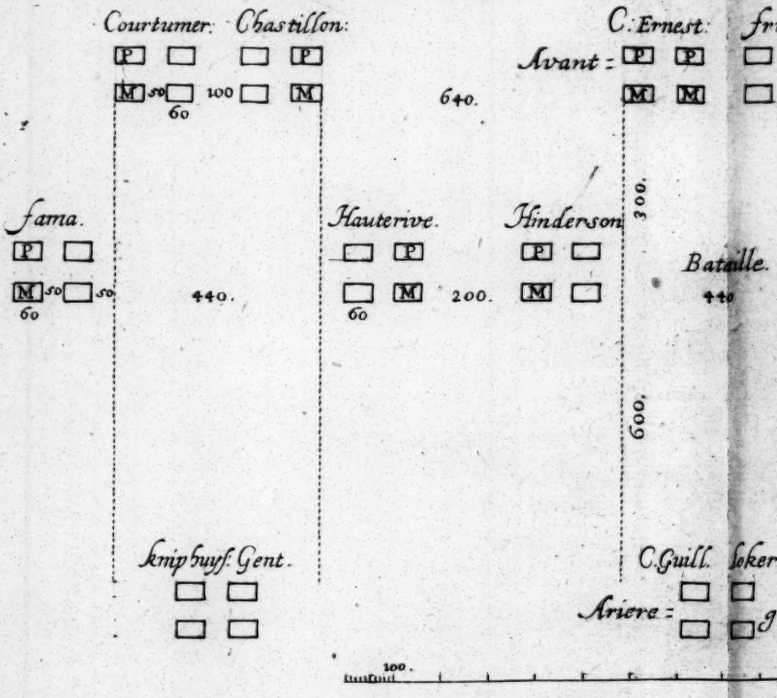
M

vant Rees l'an 1614. duquel le front est
la hauteur 1160. pieds.
efore Rees 1614. where the Front is 2750. foote.
h. 1160. foote.



Premiere Ordre d'Infanterie en Bata

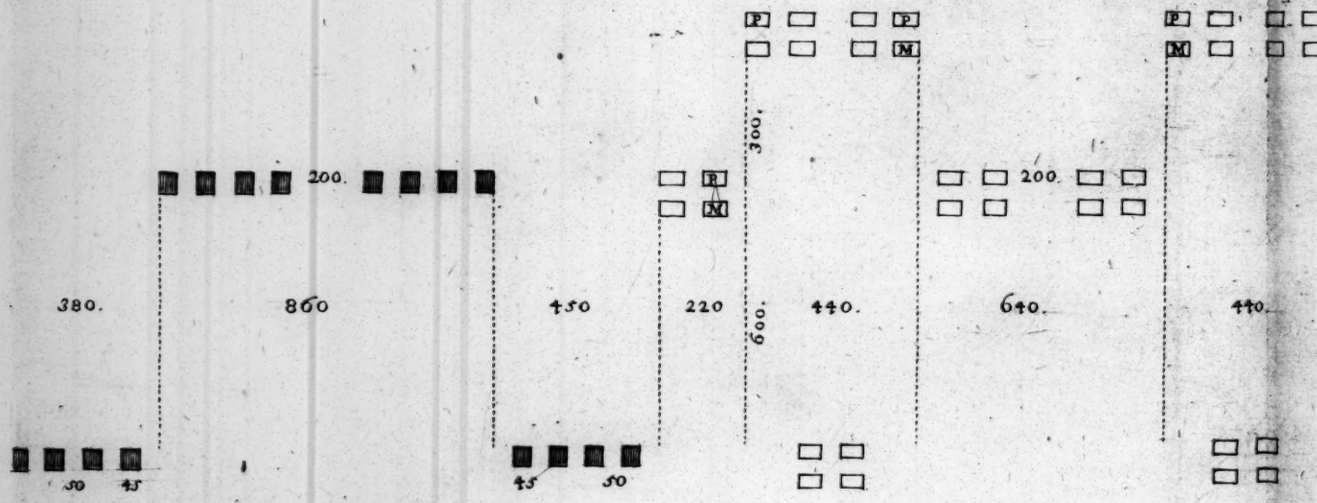
The first forme of foote embattailed by Prince Mauri



O

Seconde Ordre de Bataille de Cavaillerie, et Infanterie, Or

Tout le front de la Bata

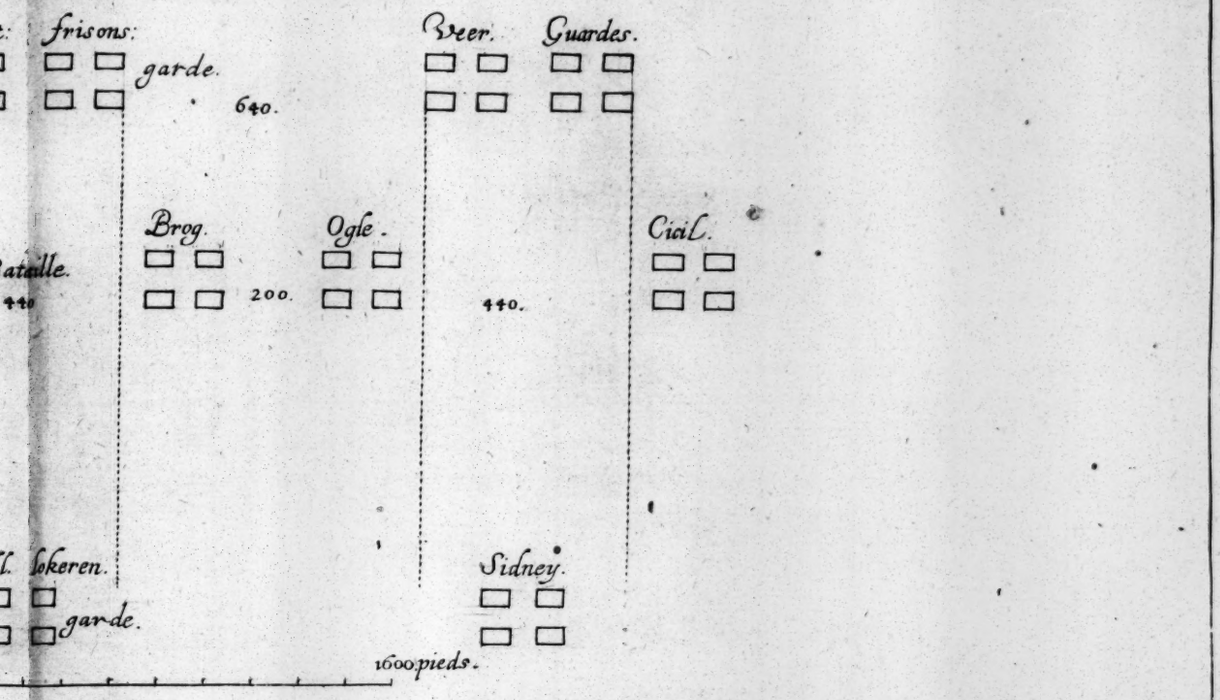


A Second forme of Horse & foote embattailed ordered by his Ex.ie before

P

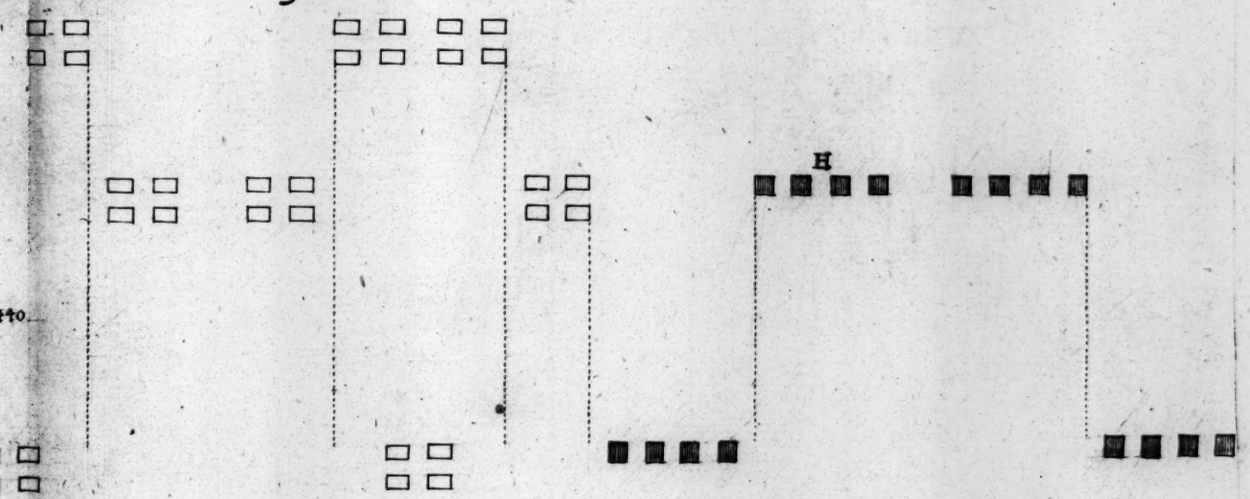
Bataille devant Doormick. l'An 1621.

Maurice at Doormick anno 1621.

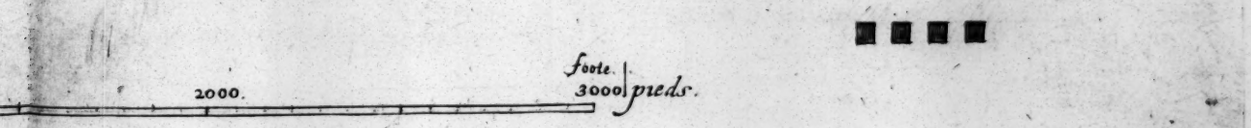


e, Ordonné par Son Exc.ce devant Doormick le 11.e de Septemb.

Bataille a 6380 pieds

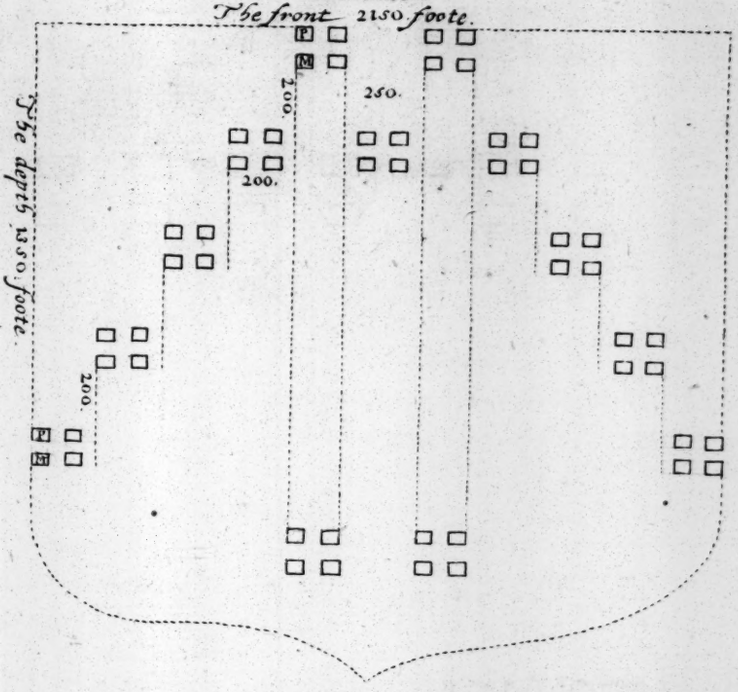


before Doormick the 11.th of September 1621.



Infanterie en Bataille.

Foote Embattailed.



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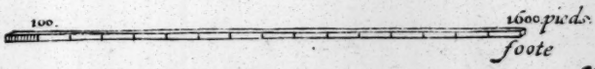
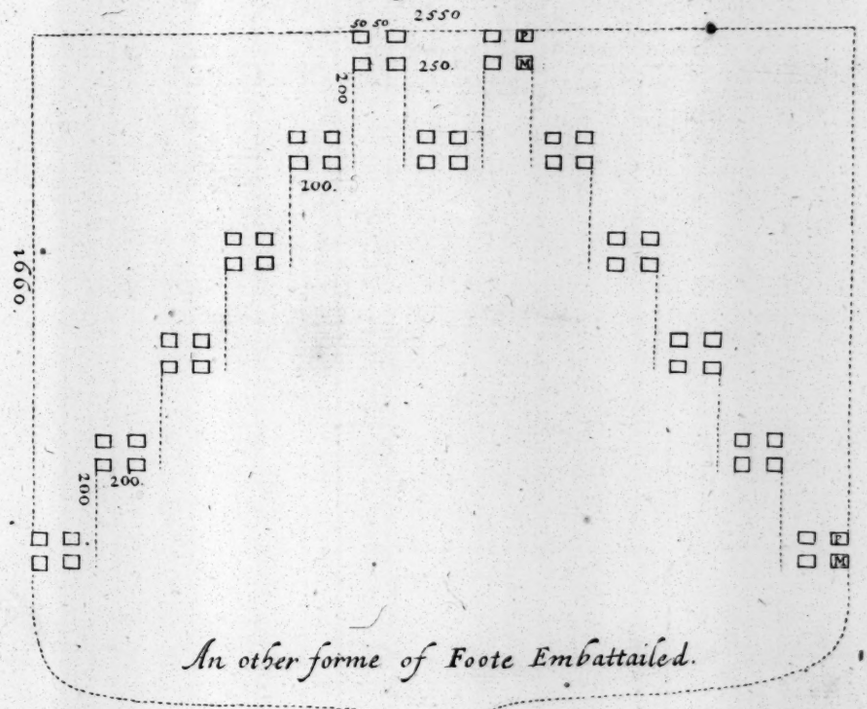


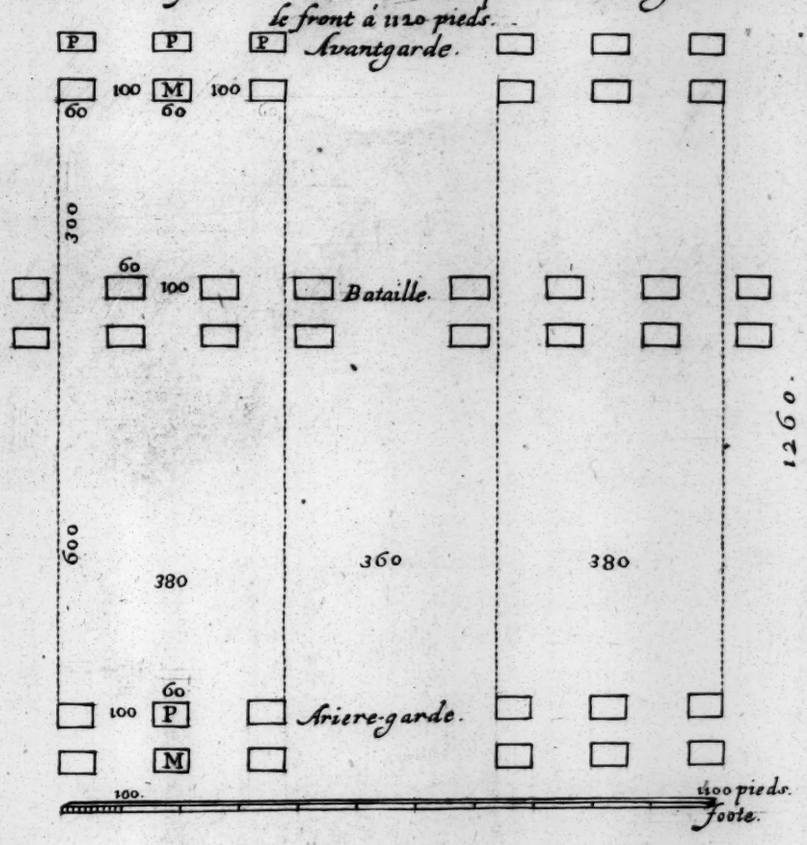
Autre Ordre d'Infanterie en Bataille.



An other forme of Foote Embattailed.

R

Ordre d'Infanterie en Bataille pres Nimmege. 1624.

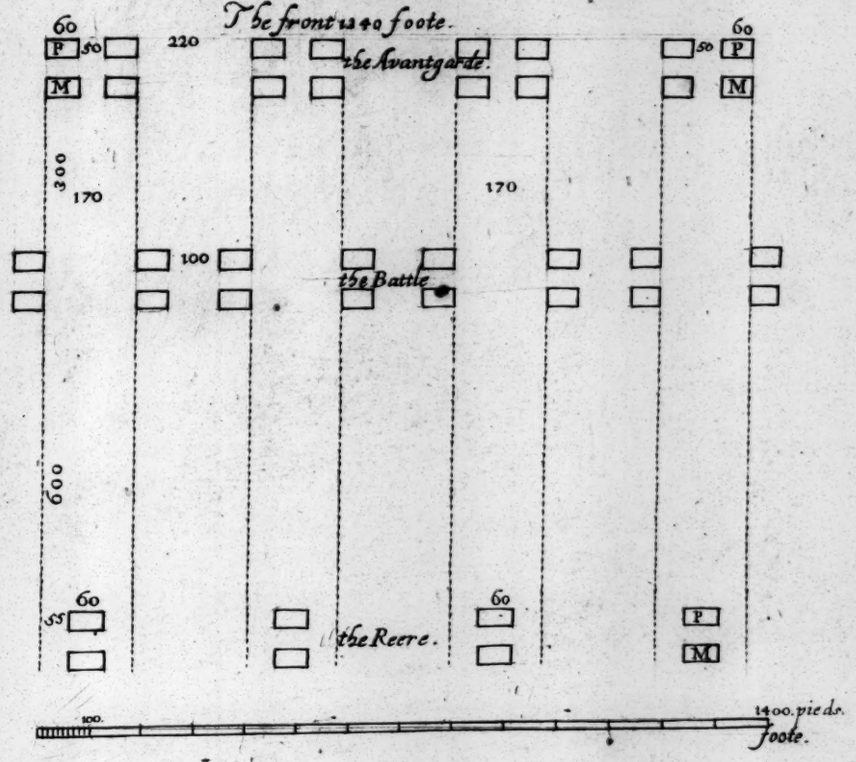


The forme of the Prince of Orangeo his Battaile = by Nemegen 1604.

S

Ordre de Bataille Ordonné par le Prince Henry á Walwic.

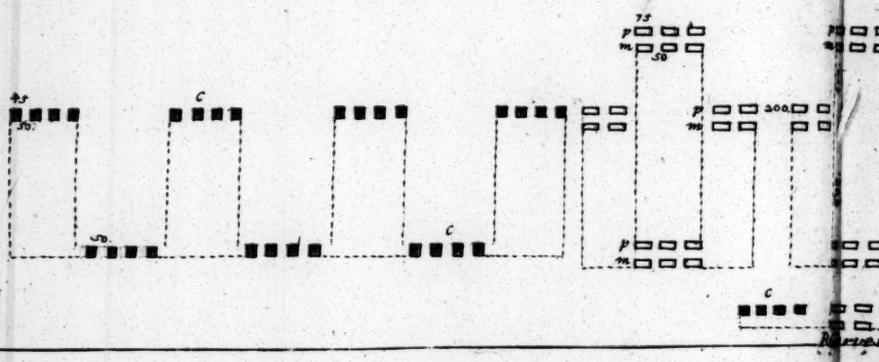
Forme of Battle ordered by his highnesse the Prince of Orange at Walwich.



T

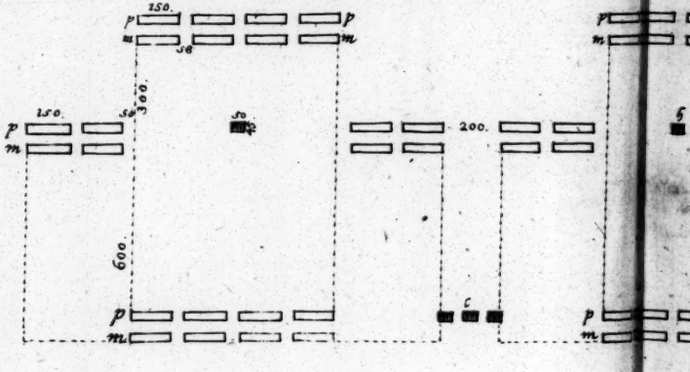
The forme of the Battle, which his Highnesse showed before Buda

Ordre de Bataille ordonné par son Altezze devant



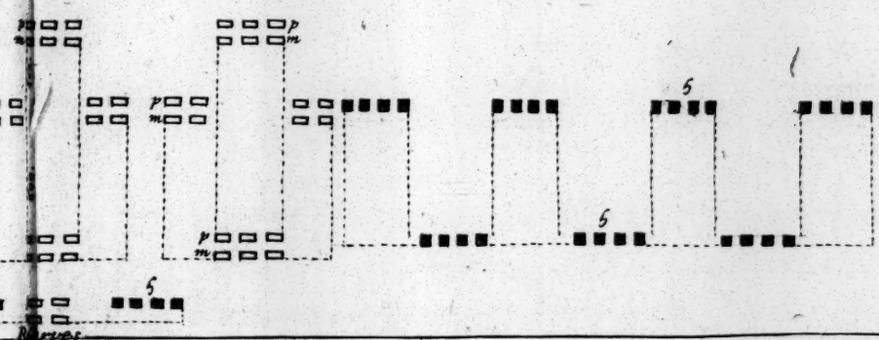
The forme of Battle shoune by his Highnesse at Mat[illegible]

Bataille ordonné par son Altezze á [illegible]



Breda anno 1634: The Front is 8195. foote.

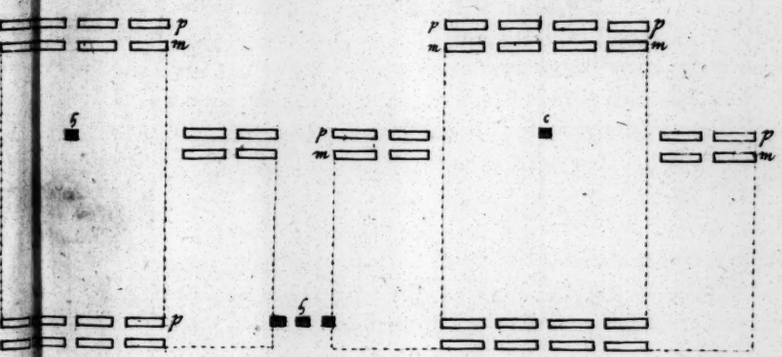
devant Breda l'an 1634. le front á 8195. pieds.



Reserves

Iarsen the 10.e of June 1635: the Front is 5050. foote.

á Iuersen le 10.e de Iuin 1635. le front á 5050. pieds.



THE ORDER AND FORME OF QUARTERING *and Encamping of an Army.*

HAving showne the figures of Generall *Formes*, and orders of embattailling, ranged in the wars of the vnited Provinces, vnder the Command of his Excellency *Maurice Prince of Orange* of famous memorie, and his Highneſſe *Frederick Henrie Prince of Orange*, our Captaine Generall that now is: I will proceede onand shew how, and in what manner an Armie ought to be encamped, with the ſeverall diviſions of their quarters; beginning firſt with a Company of Foote, and Horſe, then with a Regiment, and afterward an Armie entrenched, and laſt of all come to handle *Approches*, and all things depending therevpon, for the beſeiging and takeing in of a Towne or Fortreſſe: which for the moſt part, I have tranſlated out of *Mr Adam Fritach*, an excellent Mathematician, in his booke printed. *Anno 1635.*

THE FIRST CHAPTER.

Of three ſorts of Campes or Leagers.

THere are three kindes of *Campes*, The firſt is called in Latine *Caſtra Temporanea*, that is, A *Campe* which ſtaies not long in a place, but removes and changes euery day: the ſecond *Caſtra Stratoria* a ſettled Campe, which environeth a Towne, or a Fortreſſe with intent to take it in, and the third is called *Caſtra Suſtentoria*, a Campe lying vpon a paſſage, or river to ſtop and hinder the incurſions of an Enemie from getting into a Countrie.

The Campe which diſlodgeth euery moment is called Caſtra Temporanea.

This Campe is alſo called a *Flying Leager*, having no certaine place of abode, but at every motion, is continually to attend an Enemie vpon every remove, and this Armie is to encampe, when the Enemies Armie encampeth, and therefore is called a *Flying Campe*, becauſe it is to hinder the Enemies progreſſe.

A Campe having a trench Caſt vp about it, or beſet with Turne Pikes and Paliſſadoes.

Now for a *Campe*, which is ready to remove vpon an inſtant, we vnderſtand that, which takes vp a quarter onely for one night, which forme requires a great deale of wiſedome, and circumſpection, eſpecially when it is to march, or Quarter not farre from an Enemies Countrie. Therefore, it is very neceſſairie, that the *Generall* ſends out before, a good number of Horſe, to view, and informe themſelves of the nature, and condition of that place, where the Armie is to Quarter that night, for the accommodation where of, they ought to chuſe, as neere as poſſibly may be, a place ſituated in a plaine Feild, to which the Armie being come (and that in good time by day, the Quarters ſhall be made neere vnto the adioyning villages) if there be any and the Horſe lodged about them, in places of danger moſt ſuſpected. A campe may be encompaſſed with a Trench 4 foot high, and 3 foote broad for their more ſafety againſt an Enemie, which otherwiſe might give an attempt vpon ſome part of the Armie. The moorish grounds, where an Enemie is not feared, that may be beſet with *Turne Pikes*, or with *Paliſſadoes*, which may be taken vp againe, when the Campe removes.

After the Trenches are in defence, the Souldiers begins to make their huts of forks, lathes, withes and ſtraw, or for a night onely with ſticks and boughes, or ſuch things as they can get, the carriages and waggons laden with Amunition, Materials, and Victuals are to be lodged in the middeſt of the Campe, with a ſmall trench caſt vp round about them; but ſome peeces of Ordinance are to be planted vpon thoſe *avenues* and paſſages, where an Enemie may beſt give on vpon the Campe when the watches, and the Centinels are diſpoſed of, the reſt of the Armie goes to take their reſt, the next morning at the breake of the day and at drummes beating the Armie diſlodges, and every one makes ready for to

march away, while the trench is a Casting downe, lest an Enemy, which followes the Armie might lodge in the same quarter.

But if the Armie is not to march through an Enemies Countrie, and that one is assured they cannot come neere vnto the Campe so soone it is not necessarie to environ the Campe with trenches, but the Souldiers are either Quartered in houses, or feilds next adioyning to them, in disposing of guards, and Centunels in every place needfull, and this order of march is observed everie day, till the Armie is come vnto that place, which is resolved to be beseiged, where then a formall, and a setled Quarter called *Castra strataria* is made.

Castra Strataria and the proprieties thereof:

The propriety of this Campe may be observed well out of the Instructions of *Veget* in the 22 chapter of his first booke, as also in the *Castrametation* of *Hyginus Gromaticus*, according to these observations following.

First, that the Quarter be made in a safe place, that is, where there are no hils and heights, which may commaund and serve as an advantage to an Enemie, when he resolves to relieve the Towne, or Fort beseiged, or to assault the Campe; for being lodged and fortifying himself vpon them, he may easilie overlooke the Campe, and then it is subiect to be played vpon by an Enemies Ordinance.

That it be made (if it be possible) neere vnto some brooke or river, which may commodiously serve, aswell, for the watering of Horse, and Cattell, as also for the Souldiers, and by which, with shipping, of boats one may bring vp Munition with provisions, and Victuals to the Campe, by the helpe of a running river, or the winde for the saving of excessive charges, when one is driven to bring them vp to the Armie by *Convoyes*, and waggons, which oftentimes causeth a dearth in the Armie: for commonly Victulars, and Sutlars raises the price of their Victuals, and commodities, according to the length of the way, if they be constrayned to bring them vp by waggon hire. Besides, it is a great advantage for a Quarter, to lie by a river side, because sometimes the water may be carryed round about the *Campe*, which will make it stronger, then if it were lodged in a plaine Feild, and fortifyed with some small Forts, and Redoubts; so that all that charge is saved in makeing of workes, if the Campe may commodiously be enclosed about with water. I say nothing of the great stinke, caused by dead Horse, and beasts, as also by Butchers and their shambles, which likewise is avoyded by the helpe of Water, neither are men so subiect to sickness, and pestilence, which takes away many times a greater number of people, and weakens an Armie more, then if it were assaulted by an Enemie. For, the prevention of which inconvenience, the Carrions, panches, and garbidges of Beasts are cast into it, and carryed away with the streame, and the Butchers quartered in the most remote part of the Campe.

One must also have a speciall care, that there bee no thick-bushes, and woods about it, where an Enemie may lie in *Ambuscado*, or fortifie themselves without any hindrance, which would keepe a Campe in Continuall feare, of being assaulted by an Enemie out of a wood.

To make choise then of the fittest places, to encampe and Quarter in, those are held the most commodious, which are situated in a plaine Feild, being an Enemie may be discovered a far of, having then time to draw into Armes, to oppose them, and that the Canon may play vpon them, in case an Enemie would attempt to assault the Campe by force.

As many sicknesses are engendred by stanch, and the putrifaction of the aire: so likewise many are caused by Moorish grounds, *Marrais*, and bogs, in regard of the damps, and fogs, which riseth out of the waters, as also poysonable vapours, arising out of marshie grounds, whereupon the Souldiers hutts are built.

Therefore one ought to be well informed, before a Quarter or a Campe be made for an Armie, whether those grounds bee covered or overflowne with water, which may often happen in *Autume*, or *Winter*, which were a great annoyance, and hurt to the Campe, if it were driven to stay there all winter, and that one knew not the Condition of the place. Againe, it may serve for some vse to helpe the beseiged, or those which come to relieve the

Towne

Towne, when they may turne the water by some places into the Campe, or can cut some dikes or Seabankes, or keepe vp the water by banks, and sluces, to make it overflow the *Campagnie*, which will bring a greater dammage to the Campe, then fire would doe, therefore one ought to consider, and ponder well all these things, and to thinke vpon some remedie to prevent these inconveniences.

One ought also to make choise of such a place, which yeelds good store of grasse, and hay for Cattell, and straw for the accommodation of the Souldiers; because the want of fourrage for Horse, will constraine them to fetch it farre by convoyes, which is dangerous for the Souldiers, when an Enemie lies vpon the snap for them, and their Horses in those places, where they are driven to fetch their fourrage, which one is forced to doe with great *Convoies*, and excessive expenses. Also there must be care taken, that there bee no want of wood for fyring, and building of Souldiers huts, as also straw serving for the same vse.

A Campe ought not to be quartered too neere the Towne Beseiged, lest the Enemie may reach it, and doe great annoyance to it with his Canon, neither ought it to be quartered too farre of, but that one Quarter may with expedition relieve one another, as also those which worke in the Approches, if the beseiged should sallie out vpon them, therefore the furthest, and the neerest distance for the better safety of the Campe, is to lie without Canon shot.

The Circumference, measure, greatnesse, and largnesse of a Campe, ought to be answerable to the greatnesse or littlenesse, of it: for one must not take a place too little for a great Armie, neither a place too great for a small Armie, for the one will not be able to defend the Campe; because of the smalnesse of it, and the other not able, and sufficient to defend a great place.

Finally, it is a point of great consequence for a Campe, to have all the *avennes*, and passages that comes to it well guarded, so that an Enemie cannot lodge neare it, to hinder the provisions and Victuals which comes to it, for want whereof many times an Armie is forced to rise.

A Campe then being endowed with all these *Proprieties*, no question but it is well settled. But seing that such places are seldome found, which answers to all these proprieties discribed above, one must accommodate themselves, according to the propriety of the place, and repaire that by Art, which is wanting by Nature.

If there being any hils, or *heigths* in it, you much Quarter, and lodge vpon them, when the nature of the place will afford it, or if there be any other commodious place neere vnto the Quarter, it ought to be taken in, and environned with a Trench, and a Redoubt made in it, and Ordinance planted vpon it. But this heigth being situated vpon a passage, or place of importance, a Fort is made vpon it in taking away, as much as possible may be all advantage from an Enemie.

The seige of the *Bosch* may give vs an exsample herein, where there was a heigth situated vpon the way, as you go to *Vliemen*, and towards the Longstrate, vpon the top of which hill, a foure square Fort was made with foure *Demy-Bulwarkes*, and besides a *Crowne-worke* before it, and before that as a surplus, there was made a *Horne-worke*, all which workes were nevertheless environned with the line of circumvalation, which encompassed the whole Armie: for the Enemie could hardly assault the Campe on this side, because the hill lay so, that it commaunded all the grounds about it.

When there is no River, then all necessaries, and provisions must be brought to the Campe by waggons, wherevpon care must be taken, that the waggonmen and Sutlars set not too high a price vpon their provisions, and Victuals, which might cause a Dearth and scarcity in the Army.

For the avoyding of stincks and noisome smels, the dead Carions of horses, and other Beasts ought to be carryed and buryed farre off without the Camp and Quarters, to which order also the Butchers are subiect, for the carrying away of the paunches, and Entrailes of the Cattell which they kill, and to bury them in pits without the Campe.

The woods, thickets, and groves, which stand not farre from the Campe, ought to be taken in within the Trench, when it may conveniently be done with a small charge, which

wood and timber may serve for firing, and other good vses. But when they lie too farre of, and cannot have all within the Compasse of the line of Circumvalation, which may be dammageable to the Campe, then they are cut downe, and burnt, lest an Enemie might lay any *Ambuscadoes* in them.

Also, having a water, or a river, which may be stopped by the Beseiged; so that in time, it might overflow the Campe, one ought to take a singular care by hindring it, and casting vp of some bank to stop it, and carry it about the Campe, to discharge it self elswhere, which necessity, and experience will teach one.

All these things then being maturely considered, and overweighed, after one is well informed of the nature, and condition of the soile, lying about the Towne, or Fortresse, which is to be beseiged, and being come within two or three Dutch miles of that place, the Quartermaster Generall before the Armie rides out with some 80, 100, or a greater number of Horse, as necessity may require, to view the towne, or Fortresse to be beseiged and considers well the soile and grounds that lies about it, and draws a draught and platforme of them, that he may the better distribute, and give out the severall Quarters.

All Quarters are not alike over all, and of one and the same forme, but one must accommodate himself many times, according to the site of the place; for sometimes one must content himself with one Quarter alone, and otherwiles the Campe may be devided into two, three, foure, or many Quarters.

The Forme is also diverse, seing one must governe themselves according to the situation of the place, The largnesse must be answerable to the number of the Regiments, which are to be Quartered, and which shal be handled in the next chapter.

THE

THE SECOND CHAPTER.

OF THE DEVISION OF HVTS FOR *Officers, Souldiers, and Sutlers.*

Together,

With the true meaſure and diſtances of them, according to his Highneſſe the Prince of Orange *his new Order for a Regiment, and for the quartering of the Captaines in the Reere, for the preventing of fire, and diſorders.*

BEfore wee come to the diviſion of the ground, appointed for the Quartering of a Regiment of foote, it will be neceſſarie to diſcribe firſt, how much ground, commonly a Companie of 120, or of a 150 and of 200 heades muſt haue, which may ſerue then as a Generall rule in the diſtribution of the quartering of ſeverall Regiments, containing diverſe Colours, and Companies vnder them.

Firſt for a Colours of 120 foote, there is ordayned three hundred foote deepe. But the bredth muſt be according to the number of the heades in a Compa y, which are ſome more ſome leſſe: For a Company of 100, or 120 heads muſt take vp 24 foote in bredth, that is, two rowes of Huts, and a ſtreet betwixt them, a Companie of 150 muſt haue 40 foote in bredth, to wit, three rowes of huts and two ſtreetes, and a Collonels Companie of 200 heades, requires 56 foote in bredth, that is foure rowes of Huts, and three ſtreetes, beſides the back ſtreetes, which are betweene Companie and Company.

As for Example, the *Quartermaſter* hath giuen him a *Paralellogramma* of ground, which is 300 foote deepe, and 24 foote broade for a Companie of 120 heades, which he devides thus, from the Lieutenants and Enſignes hutts downeward to the Sariants huts in the Reere, he giues 180 foote deepe for two rowes of huts, and as is ſaid a ſtreete of eight foot, which makes 24 foote in bredth as abouesaid. Then there is a ſtreet of 20 foote between the Reere of the Sariants hutt, and the boughs of the Captaines hutt: next the Captaine hath allowed him 40 foote in depth and ſome 20 foote broad (becauſe a paſſage for the Souldiers muſt not be ſtopt vp) for him to build in, Then betweene the Reere of the Captaines, and the Sutlars hutts, there is a large ſtreete of 40 foote made for the paſſage of men and waggons, and for feare of fyre. And laſt of all, there is 20 foote allowed for the depth of the Sutlars huts, to wit, ten foote for the forepart of his hutt for eating and drinking in, and 10 foote for his Kitchin, and this is the diſtribution for a Companie, which muſt take vp (according to the Princes new order) three hundred foote in depth.

The bredth of a Quarter, is according to the number of the Heades of a Company.

In the depth of 180 foote for the two rowes of huts aboue mentioned, there may be made in each row, twentie or two and twentie Hutts with a diſtance of two or three foote betweene every Cabin, for the avoyding Eues-droppings and a little trench to receiue the Water made betwixt them.

The doores of the Lieutenants, and Enſignes Cabbins commonly opens towards the Front, and the Armes, and the Alarme place, but the Sariants towardes the Reere.

The Souldiers doores open oppoſite one to an other, that vpon any occaſion they may preſently draw out into Armes, all which parts shalbe diſcribed in the figure for a Regiment (of ten Companies) following.

HIS HIGHNESSE THE PRINCE OF *Orange* his new Order, and Forme for Quartering of a Regiment of ten Companies of Foote, to wit, the Colonels being 200, the Lieutenant Colonels 150, and the Captaines 120 Heads.

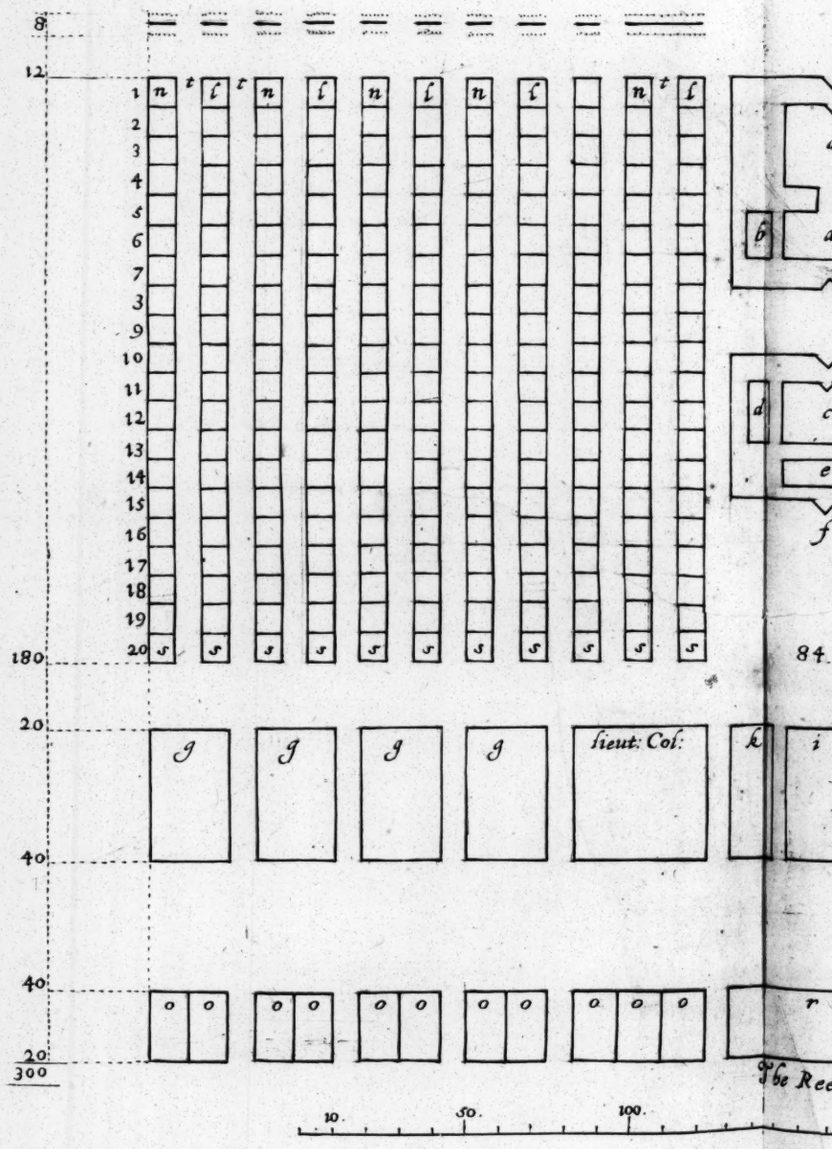
THE DEMONSTRATION.

A is the Colonels Hall, Gallerie, and Pavillion,
B are two hutts for his servants.
C the Kitchin.
D Two hutts for the Butlar, a Cellar and a pantrie.
E The Stable.
F A place for his Waggons.
G The Captaines hutts.
H The Quartermasters Hutt.
I The Preachers Hutt.
K The Chirurgians hut.
L The Lieutenants hutts.
M The Ensignes hutts.
N The crutch for the musketts.
P The Crutch for the Pikes.
Q The Alarme place, which is 200 foot between the head of the Quarter and the Trench.
R The Provost-Marshals hutt and Prison.
S The Sariants huts.
T The Backstreetes betweene each Companie.
V is 20 foote between the front and the furthest side of the Pikes.
The bredth of the whole quarter for these 10 Companies, is 436 foote.
The Coronells division, 84 foote.

THE

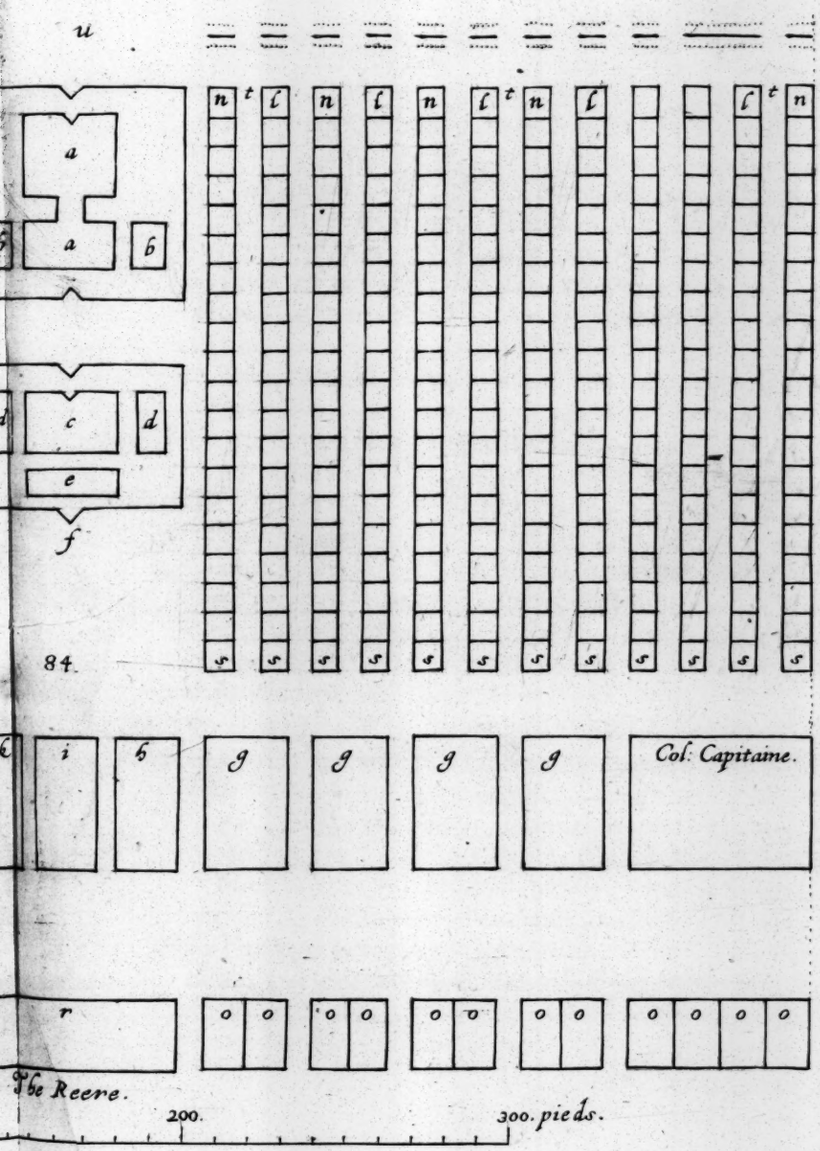
Quartier d'un Regiment d'Infanterie de dix Compaignies

His Highnesse forme for quartereng of a = Regiment of ten Compaines: the front is 434 f.



gnies, selon l'Ordre de son Altezze: le front á 434 pieds.

The alarme place 200 foote.



THE FORME OF QVARTERING OF A *Regiment of Horſe, conſiſting of five Troupes, according to the Prince of* Orange *his new Order, the Captaines being quartered in the Reere.*

THE THIRD CHAPTER.

FOr euerie Cornet of Horſe, there is ordayned (as the foote are) a depth of 300 foote, the bredth is not alwaies a like, but muſt be given according to the greatneſſe, and ſmalneſſe of the number of heads, ſerving vnder the ſaid Cornet.

A *Cornet* then containing a hundred Horſemen, muſt have a place of 300 foot deep, and 70 foote broad, wherein they are to lodge, and content themſelves

The Captaines Hutt of the Troupe, with his boughes is 70 foote broad, and 40 foote deep, being a part of the depth of the 300 foot aboveſaid.

Betweene the Reere of the rowes of the Horſemens Huts, and the Captaines, there is a ſtreet of 20 foote, and the two rowes of the Horſemens Huts (as the foot is) is 180 foot deepe, to wit, from the Lieutenants, and Cornets Huts in the front, to the Quartermaſters and Corporals in the Reere, which makes in all two hundred foote deepe, and 70 foote broad, the room for the Huts in each row is ten foote, after which there is a ſmall ſtreete of 5 foote, in which the Huts have their doores, and commings out. For the Horſe there is a ſpace left of ten foote on both ſides, alſo betweene the two rowes of Horſe, there is a ſtreete of 20 foote broad, ſeing that the Cornet conſiſts of no more then of 100 Horſe, ſo that there are placed 50 Horſe in one row, and 50 in another, and every Horſe is allowed 4 foote in bredth, and 10 foote in depth, which is the ſpace alſo appointed for his Maſter.

Betweene the Captaines Hut, and the Sutlars, there is alſo a ſtreete of 40 foote for the ſame reaſon, as wee have diſcribed in the Quartering of foote. after which there is a place for the Sutlars Huts, which is anſwerable to the breadth of the Cornet 70 foot, and for the depth of his fore Hutt 10 foote, and for his kitchin 10 foote more allowed him, ſo that the true dimenſion for the Quartering of a Troupe of 100 Horſe, is 300 foote deep, and 70 foote broad.

But a greater Cornet conſiſting of 140 heads, (or it may be 150) then they have given them a row of Huts more, ſo that they muſt have in all three rowes, of which the laſt ſtanding alone, is ſeparated from the ſecond by a ſtreete of 10 foot, which reacheth from the hutts of the ſecond row, and the Horſe are ſet behind this new row, after which (as before) there is a depth of 10 foote for a Horſe, and a ſmall ſtreete of 5 foote, and for the Huts of the Horſemen likewiſe 10 foot, whence followeth, that the breadth for a Cornet of Horſe of 140 heads takes vp 105 foote, for the two rowes taking vp 70 foot, if you adde thereunto the two ſtreets, the one of 10, and the other of 5 foote, with the diſtance left for the Horſe, and the Horſemen, making 20 foot, it is in all 35 foote, you ſhall then have the breadth of 105 foot for a Cornet of 140 heads, and the depth of 300 foot as before.

Note that euery Horſe hath his head ſtanding towards his maſters hut, that vpon any occaſion his Maſter may goe directly to his Horſe, without going about his hut.

The ſpace being deepe enough for the huts, they neede not build them cloſſe one to another, but leaue a little diſtance of a foote and a halfe, or two foote at the moſt betweene the Hutts: but betweene every fifth and ſixth hutt, there is an open ſpace left of ſome 6 or 8 foote, for the Horſemen to draw out of, if neceſſity ſhould require.

The Hutts which the Horſemen build, are built in the ſame manner as the foote are, ſaving that they take vp more roome, for the depth of the Hutts for the foote, is but 8 foote, and the Horſemen muſt haue ten.

The two firſt Hutts in the head of the Quarter is appointed for the *Lieutenants*, & the *Cornets*, and the two laſt in the Reere are ordayned for the *Quarter-maſters*, and the *Corporals*.

Before the Horſe, (between the Hutts and the ſtreets) there are mangers made for the Horſe with boords, or plancks faſtned and nailed together, which ſtand vpon poſts driven

into the ground, and have Sailes covered over them, from the one ſide to the other, and becauſe many Horſe are of ſuch a nature and condition, that they will not ſtand together, there are poſts tyed between them, that they may not ſtrike, and hurt one another.

Now if there be any likelihood, that it may prove a ſettled *Camp*, or *Leager*, then they may alſo build Huts for their Horſe, to keep them from cold and Sun. Theſe Huts are covered with ſtraw, as the Horſemens are, but are open before and behinde, (becauſe every Horſeman may have an eye to his Horſe) ſo that they are but onely covered over head on both ſides, which coverings are alſo made oftentimes with ſuch Sayles, as Tents are commonly made of.

But the Horſe being come to ſuch a place, are commonly lodged and quartered firſt in Villages, houſes, and barnes, if there be any thereabouts, at leaſtwiſe till they have built them huts for themſelves, and their Horſe. But finding no Houſes, Stables, and Barnes, or ſuch like accommodations for them, then they will be conſtrained to let their Horſes ſtand uncovered, till they have built their owne Cabins, which being done, then they may make their Horſes.

The *Ichnographie* of a Quarter for a whole Regiment of Horſe, *Harquebuſiers* and *Curaſſiers*, conſiſting of five Cornets, each of a hundred heads, ſhall be demonſtrated in the figure following.

THE DEMONSTRATION.

A D r s, is the Colonels, Sarjant Majours, and Captaines Huts, being 70 foot broad, and 40 foot deepe.

Li, and Cor, are the Lieutenants and Cornets Huts in the Front of the Quarter.

Qu, and C, are the Quartermaſters, and Corporals Huts in the Reere of the two rowes.

r a, c g, a Street of 20 foot, between the Quartermaſters, Corporals, and Captaines Huts.

a b, and g i, is the depth of 180 foote, for two rowes of Huts, from the Lieutenants, and Cornets Huts in the Front, to the Quartermaſters, and Corporals in the Reere.

a k, b c, p g, and h i, is the breadth of ten foote for the two rowes of Huts.

k l, c d, o p, q h, is the ſtreets between the Huts, and the ſtables for the Horſe, being 5 foote.

m n, e f, is the great ſtreet of 20 foot, for the whole troupe to draw out in.

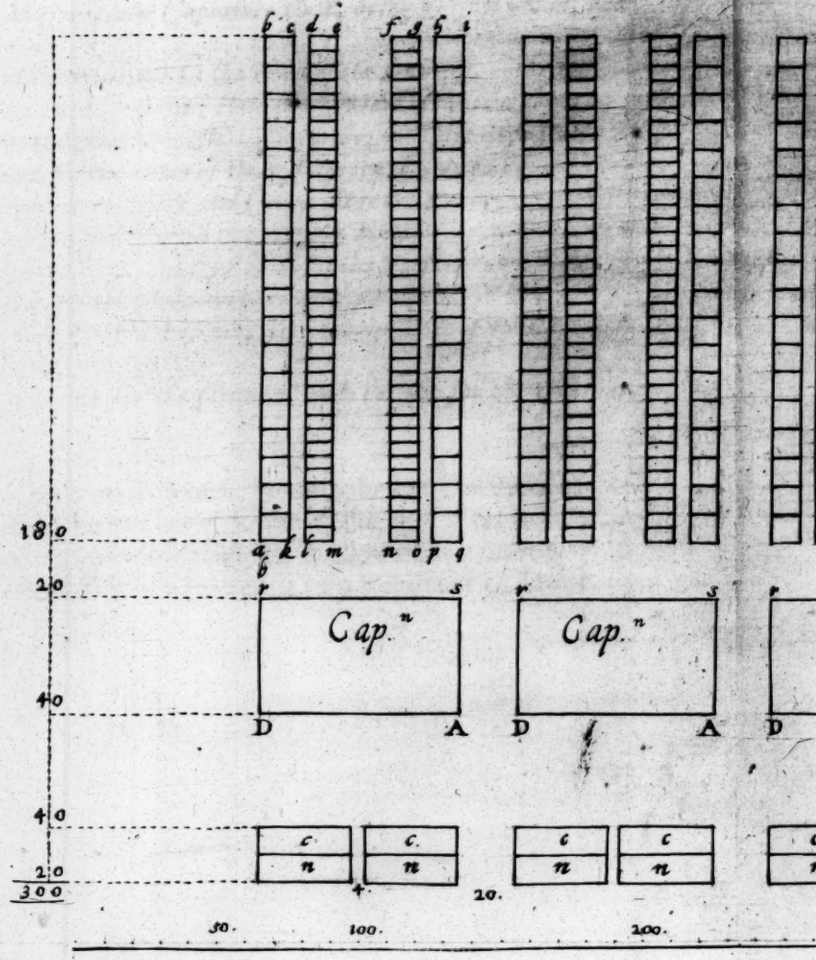
From b to t, is a large ſtreet of 40 foot, for feare of fire, between the Reere of the Captaines Hut, and the Front of the Suttlers.

C n, is the Suttlers Huts, that is, 10 foot for the forepart, and 10 foot for the afterpart for their Kitchins.

Note, that a Colonell of Horſe is allowed no more ground, then a Captaine of a troup is, onely this preheminencie he hath, to be quartered in the midſt, and if his troupe bee ſtronger, then a private Captaine is, then (as is aboveſaid) he is allowed him more ground, and another row of hutts, and thus much for the Quartering of a Regiment of Horſe.

Quartier d'un Regiment de Cavaillerie de 5. Compaig
le front á 430. pie
His Highnesse forme for quartering of a Regimen
The front is 430

The Ma



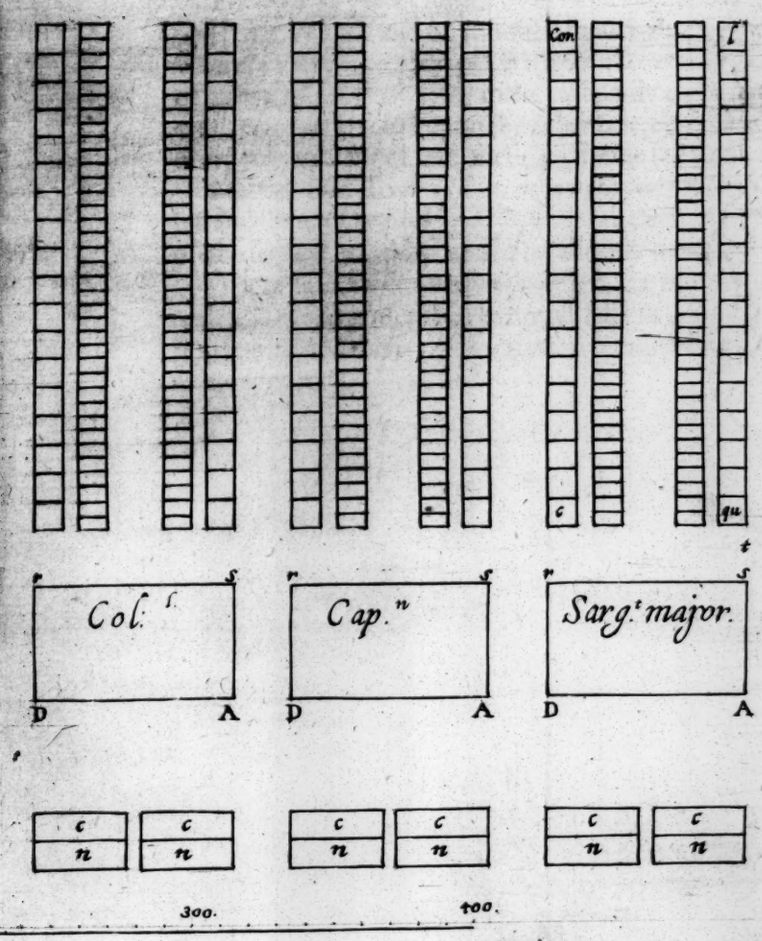
npaignies selon l'ordre de son Altezze.

30. pieds

iment of Horse, consisting of 5. troupes.

430. foote.

e Marmeplace 200 foote.



Of Particular Quarters.

BEſides, the Quarters aboue mentioned, there are alſo Particular Quarters in a *Campe*, which ought to come into conſideration, to wit, The *Generals*, The *Generall of the Ordinance*, the Quarter for the Canon, Carriages, and waggons, as alſo ſome other Quarters, which ſhall be diſcribed as followeth.

The Generall hath a ſquare place of Ground giuen him, which as a Regiment is 300 foote deepe, and 600 foote broade, and his Tents and Pavillions ſett vp, and diſpoſed of as the *Generall*, and his *Tent-maſter* ſhall thinke fitting.

Alſo there is given to the *Generall of the Ordinance*, a depth of 300 foote, and a bredth of 480 foote for him, and his traine of Ordinance, Officers, and Handie crafts men to Quarter in, hauing a little trench caſt round about it.

In which ground alſo, is built a foure ſquare Redoubt with haire cloth ouer it, to laye in powder, and Fireworkes, for feare of fyring, and to keepe them from wetneſſe, and rayne ſeing they are not ſo combuſtible and will not take fire ſo ſoone, as ſtraw, or ſailes will.

There is alſo a place ordayned of 300 foote in bredth, and depth for ſome chiefe Officers of the feild, which are not lodged within the Regiments.

The waggons alſo haue a certaine place giuen them, that they may giue noe hindrance to the *Campe*. The depth is alſo commonly 300 foote, but the bredth muſt be anſwerable to the number of waggons.

The *Market place*, where Marchands, victulars, Tradſmen, Butchers, and Bakers are lodged have a depth alſo of 300 foote giuen them, and is ſome 400 foote broad, in the midſt whereof there is an open place left for the market place, and the ſides are divided into rowes of hutts and ſtreetes. They make ordinarily eight rowes of hutts, whereof foure are ſett vpon the one, and foure vpon the other ſide, every hutt being ten foote broade, and betweene every two rowes of hutts, there is a ſtreete left ſome 20 foote broade.

The firſt two Rowes of hutts next to the market place, are appointed for *Mercers* wollen and linnen Drapers, and ſome other choiſe wares. The Tavernes, and Ordinaries takes up the ſecond, the third are for handicrafts men, and the fourth for Butchers, and Bakers.

There is likewiſe a vacant place left for the lodging of *Voluntiers* and *Strangers*, which hath noe certaine meaſure, but muſt fall out, ſometimes more and ſometimes leſſe as occaſion ſerves, and this is the deſcription of a quarter, or *Campe*, both in generall and particular, as neere as may.

The Ichnographie of a Campe.

THE FOVRTH CHAPTER.

THe *Quartermaſter Generall* makes firſt a Scale, which will ſerue for a sheete of paper, fitting it according to the proportion, as the ſaid paper will beare, either greater or leſſer, and then makes a draught vpon it. According to the meaſure of this Scale, he drawes out vpon this, ſome *parallell* lines of 300 foote deepe, which shewes the depth of every quarter, with ſome other *parallell* lines of ſome 50, 80, or 90 foote, as the ground will afford, and the diviſions betweene Regiment and Regiment.

Afterwards he marketh upon a paper, euery one of the ſaid quarters, and Regiments a part, according to the proportion of the ſame ſcale, as one hath drawne the lines aboue ſaid, and then cut it of ſoe that they haue all one depth of 300 foote, and the bredth according to the liſt of the number of the Companies of euery Regiment, and how many foote euery Regiment and quarter will take up. It were better to take a peece of paſt board paper & then make & cut out alſo vpon the ſaid paper, the depth the bredth, and the name of the regiment the Colonell and perſon to whome the quarter belongs; doing the like in all the other quarters. Theſe littles papers being ſo cut and ordered, one may put and lay them again upon the paper with the *parallell* lines aboueſaid, euen till they he laid according to your deſire, and let them be as they are fitted. One muſt nevertheleſs have a care, that the Generals quarters be in the middeſt, and that there bee a conuenient ſpace without his quarter, aſwell before, as on both ſides, as the figure following will showe marked with the letter A, where the Generall is lodged in the midſt of the Campe, and the bredth of his quarter, according to this ſcale is 1250 foote, and the depth as is ſaid 300.

The quarters are ſeparated one from an other by ſtreetes, and diuiſions ſome leſſe ſome more, as the ground will giue it, as ſomewils 500, therwhils 80, 92, or 100 foote betweene quarter and quarter, as you may ſee in the figure following.

Finally the quartermaſter Generall takes firſt the bredth and depth of the whole quarter, and Campe, and draws it ought (as is taught) upon a paper. The bredth here takes up 3000 foote and the depth 2000.

The draught of the campe being drawne upon a paper, and the whole quarter deſigned, it will be eaſie then to lay them out in the field.

How one muſt marke and lay out the quarters in a field.

To this end, the *Quartermaſter Generall* hath a chaine divided into *Rhyn-landish* foote & Rodds at 12 foot the rodd, & an inſtrument vſed in fortification, or at leaſt a wodden croſſe with foure right angles, and a good number of Beackons with banroles vpon them, called *quarter beackons*, whereof the ſtaues are painted, and are ſome nine, or ten foote long, and ſets vp one of theſe beacons vpon the angles of every quarter.

Being come into the field, in which he is reſolued to encampe the Army, firſt he layes out the circuit of the Generall quarter, with foure exteriour lines in ſuch ſort, that every corner of the quarter makes a right angle.

After one hath meaſured out the foure lines aboueſaid, he ſets vp foure quarter Beacons, and then begins to lay out euery quarter a part, according to the proportion, which he hath marked in this paper: but to the end one may not err, he puts vpon the little cut paper the number of euery quarter, with which alſo the Beacons are marked, by which meanes the ſame quarter is bounded in the field, and the number is painted, or cut upon the Beacons. It will not be amiſſe, to haue alwayes foure of them of one number, which may eaſely be known by the Beacons, in caſe they were all of one coulour. All which is demonſtrated in the figure of a Campe where the Beacons are ſet up, and noted with the figures 1, 2, 3, & 4.

The duty of a Quartermaſter of a Regiment.

AFter all this is done, and euery particular quarter drawne out in the feild, euery quartermaſter diſtributes the ground to the Companies of his Regiment, according to the *Ichnographie* of the figure of 10 Companies showne before for a regiment; In laying out of his quarter, he vſeth a line of 300 foote long and every eight foote is marked for the depth, and bredth of the huts and ſtreets, ſticking downe into the ground at euery eighth foote a bough, or ſtick, aſwell in the front as in the reere of the quarter, giuing alſo to the Colonell his ground in the midſt of his regiment. But firſt the quartermaſters prikes out the ground before and behinde for the Captaines, & giues there the bredth of the ſtreete betweene the Sarjants in the reere of the ſouldiers huts, and their owne as likewiſe the depth, betweene the Captaines boughs the Sutlars huts, marking out firſt the foure angles of his quarter, by ſetting into the ground his quarter ſtaues and flaggs of his Colonels colours.

The duty of a Sarjant.

THe quarter being ſo laid out, then the Sarjant of euery Companie kilſpits it, and diuides and makes the partition of the huts to the Gentlemen and ſouldiers, which they prick out by line and ſmall boughs, or ſticks ſtock into the ground, and ſo diuides the rowes of huts and the ſtreets among them, euery hut hauing ſome 4 or 5 foote in bredth, and for vniformity ſake 8 foote deepe, and thus the ground for a whole Regiment of what number ſoever the Companies be, is marked and drawne out in a feild, as the figure of a Regiment for 10 Companies before mentioned demonſtrates.

The other quarters to wit, for horſe, officers, ordinance, and carriages are marked by number and letter in the Campe following.

The Alarme place.

THere is left round about the circuit of the whole quarter, a *parallell* on all ſides ſome 200, or 250 foote betweene the front of the quarter and the trench, called *an Alarme Place*, for the ſouldiers to draw out into Armes, into *Parade*, or when any *Alarme* or commotion happens, the *Campe* or quarter being enuironned with a Trench, and a Parapet of ſix foote high, ſix foote deepe and three foote in the bottome, and the ditch 8 foote broade.

The ſouldiers of euery Companie are commonly commanded to make this trench, parapet, and ditch before their quarter, or where it may fall out, becauſe it ſerues for their own defence, which the ſouldiers are to doe, for their owne ſafty, without giuing them any mony for it.

There is aſſigned by the quartermaſters to euery Regiment, how much ground they muſt caſt vp, according to the commiſſion and ſtrength of euery company, which proportionally is equally diuided among the companies, that one companie do no more work then an other. In doing of which, the Captaine and officers of a companie are to ouerſee it, that the trench be done well and with expedition. Now the whole circumference of the quarter, being meaſured out by line, and *kilſpitted*, there is a generall *calculation* made, how many Regiments there are in the Campe, and how many companies each Regiment hath, that one may know how many hundred companies there are in the army. And then by the rule of 3 (knowing the line and circumference) and the number of companies, ſay, the number of all the Regiments, and compagnies which are to make up the line of *Circumvallation*, amounts to ſo many feete, or rodes, how much ground then muſt a Regiment of ten companies haue that containes ſo many men. This *calculation* being made, the companies of euery Regiment draw out ſo many men, after the quartermaſter hath furniſhed them with materials, which is quickly done, ſeing the men are relieued, and many hands (as the proverbe is) makes light worke, and will make haſt, that they may haue time to build their own huts and cabins to keepe them vnder covert.

The quarters being thus fortified, and the line of *Circumvallation* made a double ditch for horſes and ſtrong *Redoubts*, *Horne-works*, *Crowne-works*, *Batteries*, *Half-moones* and

Spurs upon the commanding places of moſt danger (as your shall ſee in the *Ichnographies* of the lines of Circumvallation before the ſiege of the *Boſch*, *Maſtrick* and *Breda* which shall be shown (God willing) in my third part of this booke, all theſe things then being done, after the demonſtration of this Campe, we come next to handle approches.

THE DEMONSTRATION OF THE ſeverall Quarters in this Campe.

A is his Excellencies quarter, which is 300 foote in depth and 1250 in bredth.
B is the Lords the States quarter being 300 foote in depth and 342 in bredth.
C the Generall of the ordinance and Magazin 300 foote in depth and 600 in bredth.
D the quarter of the Carriages and waggons.
E the quarter for marchants, tradſmen and victulars.
F Monſ. Chaſtillon quarter being 14 Companies making 28 Rowes of huts 300 deepe and 500 foote broade.
G Monſ. Bythines being 13 Comp. making 28 Rowes 300 foote deepe and 500 in bredth.
H the Freeſes being 5 Comp. making 15 Rowes 300 foote deepe and 235 foote broad.
I Str Horace Veres Regiment being 14 English Comp. making 31 Rowes 300 foote deepe and 548 broad.
K Monſ. Cicils Reg. being 7 Comp. making 15 Rowes 300 foote deepe and 292 broad.
L Colonel Ogles Reg. being 8 Comp. making 16 Rowes 300 foote deepe and 308 broad.
M Monſ. Fulchs being 6 Comp. 18 rowes 300 foote deep and 340 broade.
N My Lord of Bach-louch being 6 Comp. 12 rowes 300 foote deepe and 244 broade.
O Colonel Egmont his Reg. being 6 Comp. 12 rowes 300 foote deep and 244 broad.
P 7 Comp. Wallons commanded by Count John Erneſt 14 rowes 300 foote deepe and 276 broad.
Q Count Erneſt Lord Marshall 10 Comp. 25 rowes 300 foote deep and 450 foote broade.
R 6 Comp. of Hollanders 12 rowes 300 foote deep and 242 broad.
T Prince Henry Generall of the horſe 4 Cornets 300 foote deep and 476 broad.
V Capt. Qwicht 3 Cornets 300 foote deepe and 250 broad.
W Monſ. Marquet Lieut. Generall 4 Cornets 300 foote deep and 340 broad.
X Monſ. Ryhoven 4 Cornets 300 foote deep and 340 broad.
Y Monſ. Bax 4 Cornets 300 foote deep and 340 broad.
Z Monſ. Wagheman 3 Cornets 300 foote deepe and 250 broad.
aa Monſ. Quaet 3 Cornets 300 foote deep and 350 broad.
bb Monſ. la Sale 4 Cornets 300 foote deep and 340 broad.
cc Monſ. Stakenbrouk 4 Cornets 300 foote deepe and 340 broad.
dd The Droſt Sallant 4 Cornets 300 foote deep and 340 broad.
ee Peter Pany crimmanding the Princes guard of horſe 1 Corn. 300 foote deep and 100 broad.

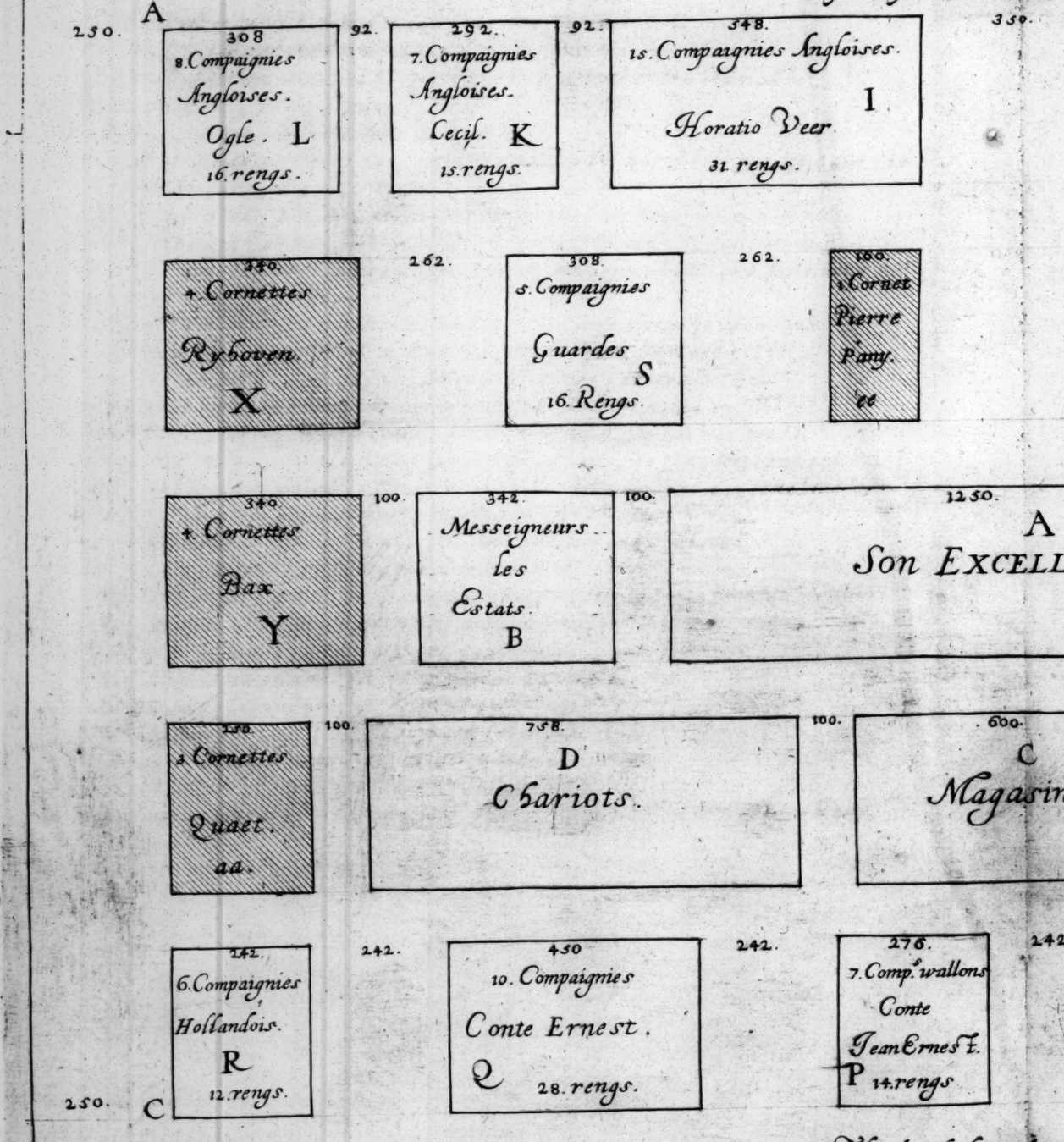
OF

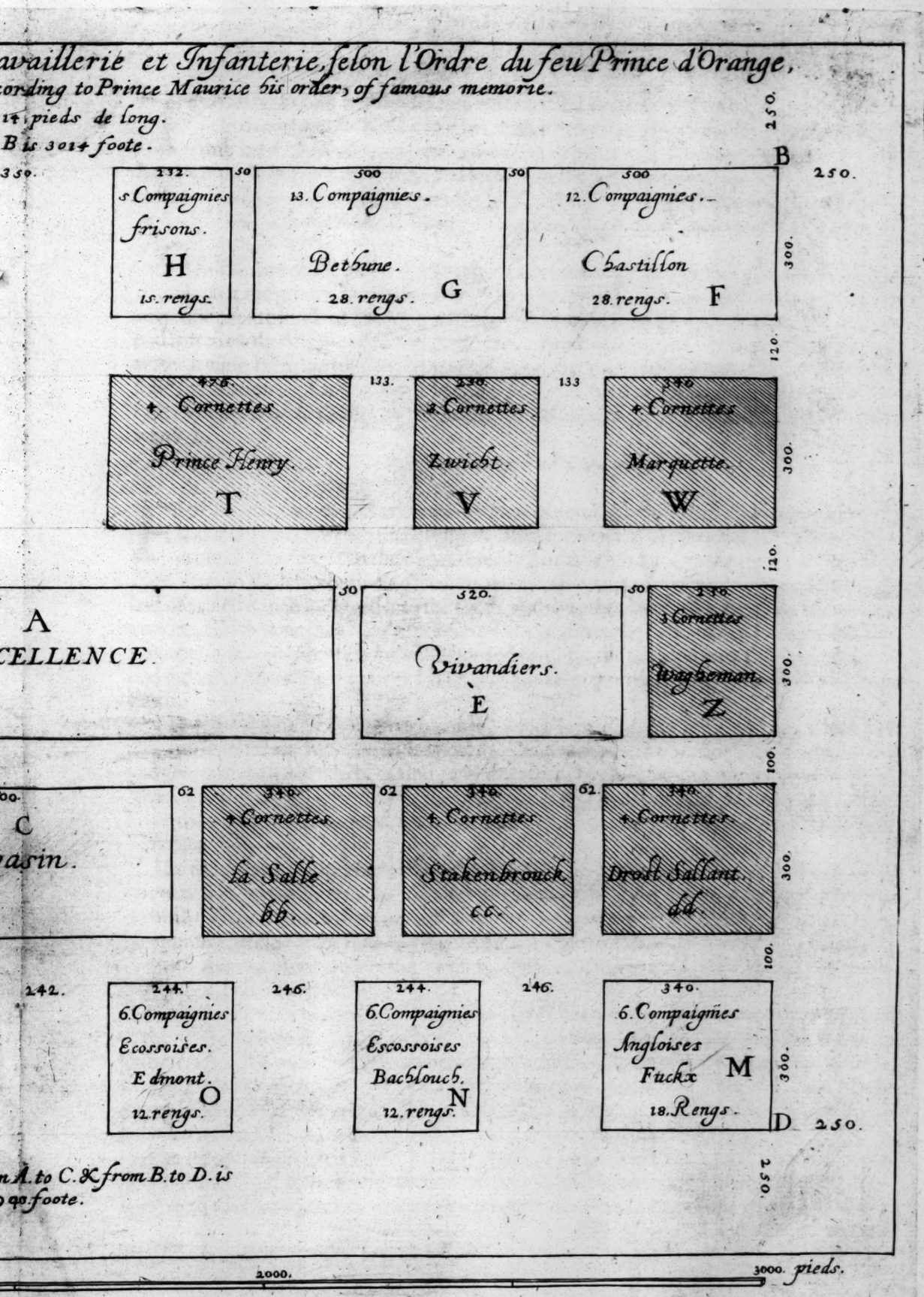
Figure d'Vne Armée en Campaigne, avecques sa Cavail

The figure of an Armie encamped, with horse and foote Regiments, according

le front à 3011 pied

the front from A to B is 30




availlerie et Infanterie, selon l'Ordre du feu Prince d'Orange,
cording to Prince Maurice his order, of famous memorie.
14 pieds de long.
B is 3014 foote.
250.
B
350.
232.
50
500
50
500
250.
8 Compaignies
frisons.
H
15. rengs.
13. Compaignies.
Bethune.
28. rengs.
G
12. Compaignies.
Chastillon
28. rengs.
F
300.
120.
476.
133.
230.
133
340
4. Cornettes
Prince Henry.
T
2. Cornettes
Zwicht.
V
4. Cornettes
Marquette.
W
300.
120.
A
CELLENCE.
50
320.
50
340.
Vivandiers.
E
3 Cornettes
Wagheman.
Z
300.
100.
00.
62
340.
62
340.
62
340.
C
asin.
4. Cornettes
La Salle
bb.
4. Cornettes
Stakenbrouck
cc.
4. Cornettes
Drost Sallant.
dd.
300.
100.
242.
244.
246.
244.
246.
340.
6. Compaignies
Ecossoises.
Edmont.
12. rengs.
O
6. Compaignies
Escossoises
Bachlouch.
12. rengs.
N
6. Compaignies
Angloises
Fuckx
18. Rengs.
M
300.
D
250.
n A. to C. & from B. to D. is
0 40 foote.
250.
2000.
3000. pieds.

OF ALL MANNER OF APPROACHES, AND *their Profiles, with the definition what approches are.*

THE FIFTH CHAPTER.

THe Approch by which one approcheth ſafeſt towards a Towne, or a Fortreſſe beſieged, are certaine hollow ditches, called *Trenches* digged into the Earth, whereby one may approch neare vnto a Towne, or a fortreſſe covertly, without any great harme, if the lines be carryed well, and kept from the ſight of an enemy.

In approching one ought to conſider well; 1 *The ſituation of the Towne or fort to be beſieged.* 2 *The propriety and forme of the approach.* 3 *The beginning and diſtance of them, and fourthly their profile.*

1 For the Site of the place, one ought to conſider well the propriety, and nature thereof, whether the ground bee high, low, hilly, or plaine. In plaine and even ground, one may finde foure kinds of Earth, to wit, 1 a Clayie and a ſolid Earth, 2 Sandie, 3 a Spongie and rotten earth, & 4 moorish and a marchie ground which may bee covered and lie vnder water, hauing no firme foundation to work vpon. Secondy, hilly places whether they have a ſolid foundation, 3 Sandie, and 4 Stonie. Alſo one muſt take into conſideration; the Forreſts, woods, wayes, ditches, hills, and ſuch like things, as may lye round about it, or go towards it.

Of foure manner of Approches.

FIrſt, if one cannot make choiſe of ſuch ground, as they deſire, then one muſt take it as it fals out, whence there follows diuerſe manner of Approches; for, if it be good ground, then they run their lines directly from the left hand to the right, and from the right hand to the left, continuing it *alternatively* till you come to your diſtance deſired, the half of which trench is digged into the Earth, and the other halfe caſt up with a *parapet* raiſed vpon it, which ſerues as a blinde to keep your men from the ſight of an enemy, and thus you continue your approch by windings and turnings, till you come to the *Counterſcharfe*, and moate of the Towne beſieged, and this kinde of approach you vſe in good and firme Earth.

The ſecond kinde of Approach is that, which is made in a *Sandie ground*, which you may run in the ſame manner with windings, and turnings as you did the firſt, ſaving that your *parapet* will not hold with ſand, and therefore, becauſe Sand is not ſo good to work upon, and will not lie ſo firme as other Earth doth, but will coſt more labour, and require more time then ſolid Earth, therefore one muſt approch neerer and neerer by ſetting vp of Gabions.

The third way hath another difference, then theſe two abouementioned, for ſometimes one may finde good Earth, and Sandie mingled together, yea, and ſomewhiles a *Marrai* on both ſides, in ſo much that one ſhall haue but a narrow way, through which one is to carry his approch, and as in the former you cannot run your lines from the left hand to the right, or from the right hand to the left, ſo in this you are driuen to run a line directly vpon the Towne or Fortreſſe beſieged.

Now this manner of approach carried in a right line, is not ſo labourſome and chargeable as the others before-named, which are run with *oblique lines*: but the greateſt labour is, ſuch an Approach muſt be made deeper, then the former, & do require a double trench and *parapet*, whereas the others haue but a ſingle one, and euer and anon there muſt be blinds ſett vp becauſe this kinde is more dangerous, and in this approch the one half of the Earth is ſett up with a parapet on the one ſide, and the other half on the other ſide.

The Appproch which is made through moorish, and marchie grounds ouerflowne, is almoſt impoſſible, by reaſon of the inconſtancie of the water, which riſeth, and falleth according to the ſeaſon, and which cauſeth many inconueniences: for when one expects dry

ſeaſon, the weather may alter and proue rainie and ſtormie, which may not onely hinder the approch begun, but alſo fill the trenches with water, therefore in ſuch caſes, one muſt accommodate themſelves, according to the weather, and vſe the wiſedome, and experience of Inginiers herein, for the preuenting of theſe inconveniences.

As the half of an ordinarie approch, is digged into the ground, ſo the other half is caſt vpon ground: this kinde being made over water and *Marras*, having no firme foundation, the foundation of them is layd by filling vp the water with bundles of Boughs, Brush, faggots, and ſuch like things, hauing Earth caſt upon them, to ſettle them, and make them lie faſt, and the Earth being brought upon wheelebarrowes from ſome other place, a *parapet* is raiſed, and blinds ſett up, that the workemen, and ſouldiers may work and be in more ſafety, which guards it.

The fourth difference of approch, is alſo made by Earth brought from ſome other places, having *Fagots*, *Brush*, *Bavins*, and planches layd vpon it, with *parapets* and blinds ſett vp.

Fifthly, having want of good Earth, and finding great ſtore of Sand, then the parapet muſt be made with *Gabions*, and Cannon Baskets filled with Earth.

The ſixth & laſt manner taketh its originall from the former, and is made with Redoubts in joyning the one to the other.

And if your meete with a ſtonie place, then you muſt help your ſelf with *Gabions*, & fetch your Earth from ſome other place, as you did in marchie grounds.

Theſe are all the ſeverall kindes of Approches, that we have mentioned here in this Chapter, which one cannot make without difference & judgement, becauſe the one is more laborious, and dangerous then the other, as we have taught.

But to the end all inconveniences may be avoided, one muſt firſt informe himſelf well of the nature of the place, through which one is reſolved to run an approch, and take a ſpeciall care, that no errour and faults be committed through ignorance, which may looſe time expence and labour, and may croſſe the happy ſucceſſe of an Armie, for it were an abſurd thing, if one ſhould make that approch in a moorish ground, which is to bee made in a plaine place, where there is good Earth, where one hath elbow room, and ſpace enough to run obliques lines, or when one would make them above the ground, when there is Earth enough to he digged out of the ground and caſt vp.

Beſides, one ought to conſider well, the diſtance of the firſt breaking of ground, between it and the Towne or Fortreſſe to be approched to, that one begins not too neere, nor too farre off, for the beginning of the Approches being too farre from the Fortreſſe, one looſes both time and paines, when one begins to breake ground from a place which is in ſafety.

On the other ſide', to begin an approch within the ſight of an Ennemie, one cannot ſo well defende himſelf from musket shott, becauſe the Muskettiers may take a ſurer marke, then when they shoot at *Randum*, and it will be hott for the workmen, before they can gett into the ground, beſides the workemen cannot be ſo well ſeconded, and relieved without great danger, eſpecially if the beſieged ſallies out, and gives them hott *Alarmes*, ſo that they muſt be preſently, relieved, or elſe they will be driuen to quit the approches and to retire, if they be not ſeconded betimes.

The diſtances betweene the beginning of an Approch, and a Fortreſſe.

HEnce one may clearely vnderſtand, the diſtance of the Approch to the Towne or Fortreſſe beſieged, and the place where one begins to breake ground firſt, ought to be as farre, as a musket can well carry from the outworks of the Fortreſſe, which may be about ſome 90, 80, 70, or 60 rod at 12 foote the rodd, or as the nature of the place will afoard it.

The

The beginning of an Approch. or firſt breaking of Ground.

When one would begin an Approch, there muſt be choiſe made of 200, 300, 400, or 500 luſty ſouldiers, which are vſed to work, now beſides the ordinairies armes, which they carrie, they take downe along with them into the approches ſpades, shovells, pickaxſes, and others materials neceſſary for work, and are ſet in order by the Ingenier in that place, where the Approch begins, and to the end they may begin with the more ſafety, they have diverſe *guards* of Foote, and horſe ſtanding up and down, here and there to defend them, if the beſieged should ſally out vpon the Workemen, and becauſe they may make a good beginning, firſt they caſt up a *Redoubt* or two, from whence the trench & approch is run, which are environned with a parapet, & a good ditch, and the ſides of the redouts made ſome eight rods ſquare, as you may ſee in the profile of trenches.

Indeed, ſometimes as occaſion may ſerue, they make *demy Bulwarkes*, or it may bee *Whole Bulwarkes*, for which one takes a *Profile* anſwerable to the greatneſſe, for when they are little, one makes vſe onely of the *Profile* of ordinaire trenches, and when they are great their *Profile* muſt be likewiſe correſpondent vnto them.

Theſe workes and Redouts ſerve for a Retreat to the Workemen, if an Enemy should make a great ſallie vpon them: for being retreated into the ſaid *Redouts*, they may reſiſt an Enemie, and ſtopp them, till they are ſeconded, ſo that ſuch *Redouts* are very neceſſary. For if the workemen had not a place to retreate into, they would be forced to betake themſelves to their heeles, and to abandon and looſe their worke.

But the *Ingeniers* which are employed therein, ought to vſe all the skill, induſtrie, and experience they have to run their lines in ſuch a ſort, that thoſe which are in the trenches and approches may not be diſcovered and ſeen by an ennemy. In a word, they may runne their approches with the more ſafety, and as much expedition as poſſible bee towards the place, or part of the Fortreſſe, which the *Generall* deſires to become maſter off.

There are two principall parts in a Town or Fortreſs, one of which muſt be battered, if one is reſolved to take it in, and that is, either a *Curtaine*, or a *Bulwarke*.

What part of a Fortreſſe ought to be approched to.

IT is not good to approch to a *Curtaine*, which is defended by the two next Bulwarkes, and their flanckes, when you are to expect an enemies Canon continually on both ſides of you, eſpecially, when you would give an aſſault vpon it; for afterward it may eaſely be cut off. Beſides that the moate is broader before the Curtaine, then in other places, whence it followeth manifeſtly, that there is no advantage in approching vpon ſuch a place.

But a *Bulwarke* is the ſafeſt, and beſt to be approched to and taken in: my reaſons are theſe, firſt the moate is not ſo broad and large, as it is before the *Curtaine*, and a Bulwarke hath but a ſingle defence, coming from the Bulwark oppoſite to it, which may be better beaten upon by Batteries then the Curtaine can. Moreover, a Bulwarke hath but a little defence of it ſelf, becauſe on may be forced to retire from it, and to make new workes, and cuttings of behinde that part which is quitted. And becauſe there is no ſo much ſpace, as is within the curtaine, the fortification thereof is more painefull and more incommodious, and therefore it is better to approach towards Bulwarkes, then curtaines, which is found by practize, and daily experience.

There are other works belonging to a Town, or Fortreſſe, as (*Crown-works*, *Horn-works*, *Tenailles*, *Ravelings*, *Halfe-moones*, and others. The manner of carrying of approches wilbe cleare and eaſie enough, when wee come to ſhew an approch by figure vpon a Towne or Fortreſſe which is to be taken in.

After one hath maturely reſolved, whether he will run an Approch vpon a Curtaine, or a Bulwarke. The Ingenier being preſent at the breaking of the ground, is to ſhew & informe the workemen well, how they are to run their line, and as neceſſity requires, being of diverſe lengths, but moſt commonly ſome 20, or 40 rod long, or ſometimes shorter or longer,

and broken and turned as often as is neceſſary. The line then being laid out and marked they divide and place the Workemen in order, that they may not hinder one another.

Now they giue to euery man the length of foure or fiue foote, and every one maketh as much haſt as poſſible may bee, to gett into the ground, for the avoyding of the danger whereunto he is expoſed, while he ſtands vpon the open feild, therefore the Earth which he diggeth he caſteth it vp before him, and with all expedition maketh a hole like a graue: it is needleſſe that at the firſt breaking, the ditch should be any broader or deeper then three foot, for the Earth being caſt vp three foote aboue the Ground, and the ditch likewiſe three foote deepe, a man then hath covert enough.

The Workemen then being got into the Ground, they enlarge and deepen the Approches as neceſſity requires, but thoſe which are fardeſt of from the Towne, they need not be ſo deepe at the beginning, as when they come neerer to the Fortreſſe. The bredth of the Approaches ought to be ſome 10 or 12 foote broad, as may be found neceſſarie: yea, ſometimes one is conſtrayned to make them larger, leaſt they might be too narrow, in regard waggons may be driven through them with materials neceſſarie for the Gallerie, as alſo Canon which muſt be drawne downe, and mounted vpon the Batteries.

But by how much larger the Approches are made, by ſo much ought the parapet of the Trench to be heightned, that the Enemie may not diſcover the Souldiers that are in them.

Eſpecially one ought to heighten thoſe points, and windings, where the Line turnes, otherwiſe it may proue very hurtfull and dangerous.

While the Souldiers are buſied in makeing of the Line, others are employed in makeing of a Batterie, to hinder the Enemie from Sallying out.

When the night is paſt, there are fresh workemen ſent downe to relieue the firſt, and to enlarge, heighten and repaire that nights worke, vnleſſe ſome of them are willing to continue their worke, and theſe commanded men, are to haue ten ſtivers a peece, which the Quartermaſter of every Regiment, who delivers the matterials doth ſolicite for and payes them.

After the firſt nights worke (or it may be the ſame) there are *Corps de guard* made, to putt a good number of Souldiers into, where they keepe their *Maine guard*, which are made ſometimes within the lines, with which the *Corps de guard* ought to be *Parallels*, or elſe vpon the point where the line turnes, and ſometimes without the Approches, to which the *Corps of guard* are ioyned to them by a line of *Communication*: ſo that they lie three or 4 Rod from them.

It is not alwaies needfull that theſe Redoubts be made ſquare, but one may make them *long-wiſe*, or elſe with 5 *Angles*, and after diverſe other manners, as the Ground will beſt afford.

Moſt commonly one workes by night, that they may receiue the leſſe harme, and that the day following the worke may be repaired.

When one line is finished as abouesaid, and that it muſt be run no further that way, the *Inginier* turnes the line another way, (bearing it from the Towne or Fortreſſe) and placeth the Workemen in order as abouesaid, in continuing ſo by windings, and turnings, till he hath gott ſomething neere vnto the Fortreſſe beſeiged, and makeing good the Line continuly with *Corps de guards* and Batteries.

But the neerer they approach vnto the Fortreſſe, the more ſubiect they are to danger, ſo that their pay is encreaſed every day, as the Approach is advanced, ſeing they hazard their liues for it, they haue a halfe Rixdaller a night, ſometimes a whole Rixdaller other-whiles a Rixdaller and a halfe, yea ſometimes ten Rixdallers for an howers worke, if it be very dangerous.

Finally when you are approached with your trench ſo farre that you are continually in the ſight of an Enemy, and where you cannot get any more ground, but with great danger, they make vſe then with an other manner of digging, or an Approach called commonly a *Sapp*, which is made in this manner following.

When a reſolution is taken, to approach vnto a *Curtaine*, or a *Bulwarke*, you run a right line

line vpon that place, which you intend to aſſault: as for example, ſuppoſe it were upon the *Demiface* of a Bulwark, in ſuch ſort, that it lies without the flancking blowes of the Fortreſſe.

A man then kneeling vpon his knees, diggs to get into the Ground and caſts vp the Earth before him on both ſides, with a ſhort ſpade towards that part of the Fortreſſe, till he hath digged three foote into the Ground, and that hee is covered with the Earth, caſting alwaies the Earth like a moald before him towards the Towne, and on that ſide, where the moſt danger lies, he ought to caſt vp the Earth ſo high that it may be able to ſhelter thoſe, which comes to repaire and make the Sapp larger. After the firſt man which makes the Sapp is got into the ground and covered with earth, he advanceth forward and continues the Sapp, till he hath got ſome ſix foot, and then follows another Sapper preſently, who repaires and enlargeth the ditch to the bredth of ſix foote, while the other advances forward three foote further in bredth, and got ſo deep, that he is alwayes covered with the Earth, which he caſts vp before him, and the other follows him continually enlarging the ditch from three foot to ſixe. After him comes a third man, which finiſhes the whole Sapp, and gives it the conuenient height, depth, and bredth anſwerable to the firſt approch. But one muſt have a ſingular care, that the approches and Sappes bee not digged ſo deepe, as that water may riſe in them, but that they may alwayes remain dry vpon firme ground, which the condition of the ditch wil ſhew it: For when the water within is very deep, and the declination high enough, one may make the Approches as deepe as the ditch, when the water that is in it, is diſtant from the plaine Earth.

Touching the manner of Working, an Agreement is made with certaine workemen, becauſe a greater number of workemen cannot worke in ſo narrow a paſſage, they take on fiue or ſix workemen, and give them 4, 5, 6, yea ſometimes more rixdallers apeece, as they can agree with them, and as the danger is little, or great.

In this manner of work, being come ſo neere for the ſafeguard of the Muſkettiers, which are to giue fire, there are *muſket baskets* ſet vp vpon the top of the *parapet* of the approches, cloſſe one to another filled with Sand or Earth, between which the Muſkettiers puts out the noſes of their muskets to giue fire upon the beſieged.

And becauſe the approches, the neerer you come to the Fortreſſe are made much deeper then at the firſt breaking of ground, there are one or two *foote bankes* made for the ſouldiers to mount vp vpon, and to diſcharge their muskets or firelocks.

As for example, the figure following numbred 153, is the part of a Towne or Fortreſſe vpon which wee are to run our approches, and that vpon firme and good ground.

The Firſt Example.

For as much as the Fortreſſe is enuironed with a *Corridor* or a Counterſcharfe, one muſt not take the diſtance from the great *Rampart*, but from the *Counterſcharfe*, and begin the approches ſome 90 rods diſtance from the *Corridor*, becauſe one may with the more ſafety put the ſpade into the Earth. Therefore one beginneth the firſt line of approch from the letter *A*, and runs it to the letter *B*, being ſome 30 rods long or thereabouts. The beginning of the line is fortified with a *Redoubt* marked with the letter *C*, into which the workemen (if the beſieged ſhould fall out) may make their retreate, and into which alſo the guards for the workmen may retire. The firſt line turneth at *B*, taking its beginning neere vnto the *Corps de guard D*, and runs to *E*, being ſome 30 Rodds in length, where another *Redoubt* is made marked with the letter *F*, to hold a guard in it, and becauſe it might be dangerous to run this line any further, it turneth from *F* to *G*, and from *G* to *H*, where another *Corps de guard* is made. For the neerer you approch unto the *Fortreſſe*, the more the approches muſt be ſtrengthened with guards and batteries. Beſides the approches there ought to be made deeper, and higher, becauſe you come neerer the Enemies, Canon, and his Muſket ſhott, which may ſhoot the ſurer upon you, here then you begin to ſet up muſket baskets, and make foot-bankes to your approches, that the ſouldiers may gett vp to them when they are commanded to giue fire.

When one is approched ſo neere by meanes of theſe turnings and traverſes that the remainder may be run with a long *Traverſe*, then one begins to Sapp from *H* to *I*, from which alſo one may make another line to approch unto the other ſide of the ſame Bulwarke, or alſo the other Bulwarke, as the line from *I* to *K*, shews. Behinde theſe lines the muskettiers gets up allwaies to diſcover, and shoot at thoſe that would peepe into them.

There are likewiſe two Redoubts made on both ſides for guards, as the letters *N* and *O*, do show.

In the *Interim* a Sapp is begun, that runneth towards the Bulwark, which one is reſolved to mine in, and which is made in the ſame manner, as we have deſcribed aboue, when you ſapt into the *Counterſcharſe*, and that you are come to the brinke of the *Moate*, then you are to fill and damme it vp, and to make a gallerie, and blinds which wee will treate off when wee come to ſpeak of a Gallerie.

While you are buſyed about making your approches, diuerſe batteries are made here and there, which ſerue partly to ſpoile the Ramparts, and partly to diſmount and hinder the Enemies Canon from playing upon you, and to keepe the beſieged in awe, that the workmen may worke with the more ſafety, as you ſee by theſe ſixe batteries noted in the figure 153, and thus much for approches vpon good ground.

Wee haue divided the approches, which run in a right line into three ſorts: The firſt is in a narrow way, an Earth which may be ſpitted out ſomewhat deepe, and yet nevertheleſſe without turnings and *Traverſes*: The other is when you cannot digge into the Earth, but there is, or you ſhall have water preſently, as hapneth in low and moorish grounds.

The Second Example.

When you are to approch vnto a *Fortreſſe* in a right line, and that the nature of the way through which you are to carrie your approches, is of ſuch a condition, that you cannot digg into the Earth with ſpades, then you muſt do as is showne in the figure 154, where they are covered with Earth both on ſides, & are made a little deeper then ordinary Approches. Now ſeeing the danger is greater in this kind, then in the firſt, and that a right line cauſeth you to be continually in the ſight of an Ennemy, you muſt prevent, and avoid that danger by making of blindes, which are either made of bundles of riſe, or brush, or with thick oaken planckes foure or five ynches thick, and as in this figure you may ſee, for what vſe they ſerve.

The third example.

There where one cannot digg, as in Marras and moorish places, a foundation muſt be made with ſinkers, that is bundles of boughs bound faſt together, vpon which (as is ſaid) Earth is caſt. Vpon this foundation one makes *Traverſes and Blinds* with *Gabions* as you may ſee in the figure 155.

Theſe *Gabions* are alſo filled with Earth and made ſo ſtrong, that they are Canon proofe, one may ſett vp alſo a double row of *Gabions*, which ſometimes haue Earth caſt about them.

The bredth of ſuch approches is from 4 to 8 Rod, as the place is narrow or broad, and as neceſſity and danger requires, but the Ordinarie bredth is noe more but foure or fiue Rod.

One muſt haue alſo a care, that one *Traverſe* endeth there where an other beginneth, to witt, there where an alley is left.

The like manner of *Approches* were made at the ſeige of the *Boſch on Count Erneſt* his ſide, to which as being a new found-worke, it got a new name, and was called the *Greate Gallerie.*

This manner of Approch may be vſed alſo in a ſtonie ground, where one cannot digg the Earth becauſe of ſtones.

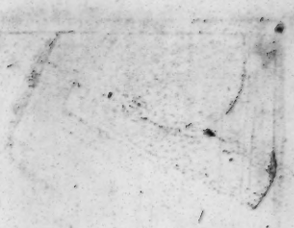


fig. 153.

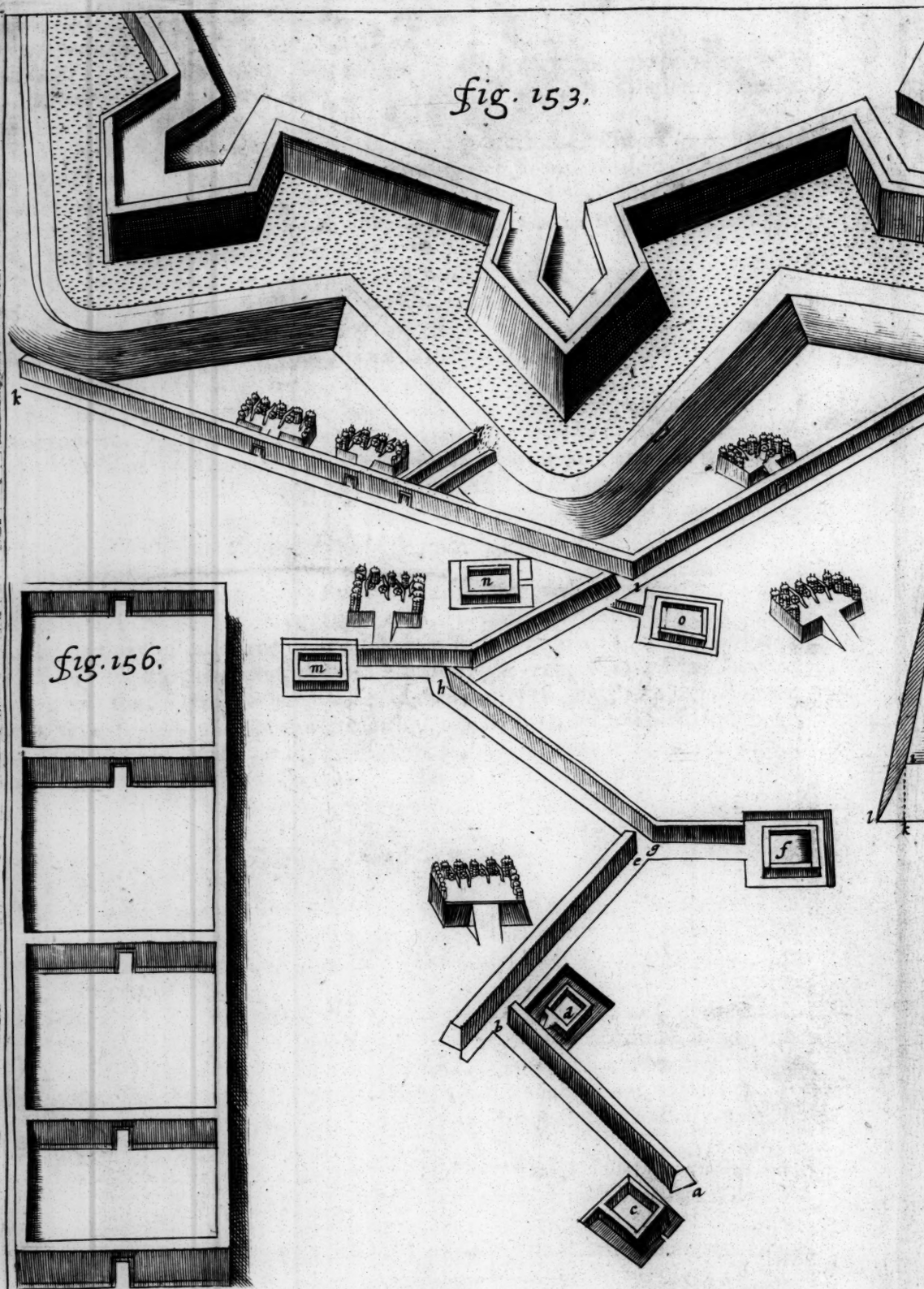


fig. 156.

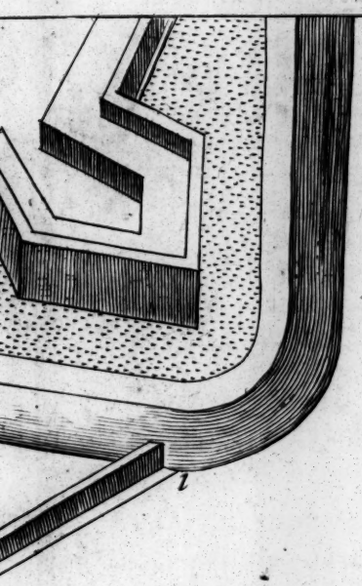


fig. 154.

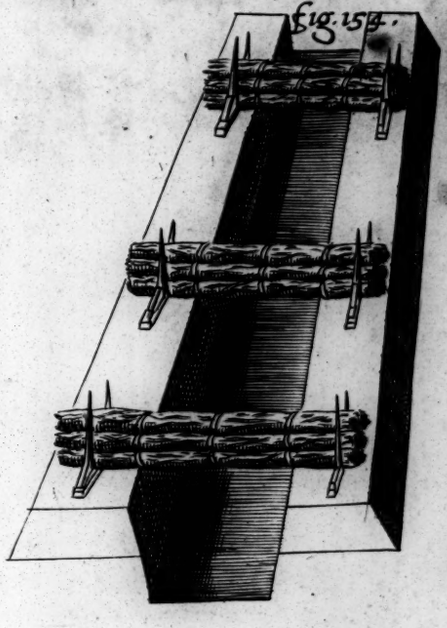


fig. 155.

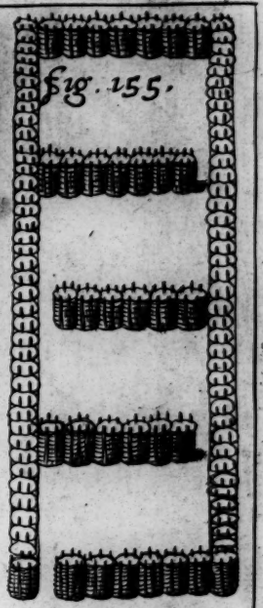


fig. 157.

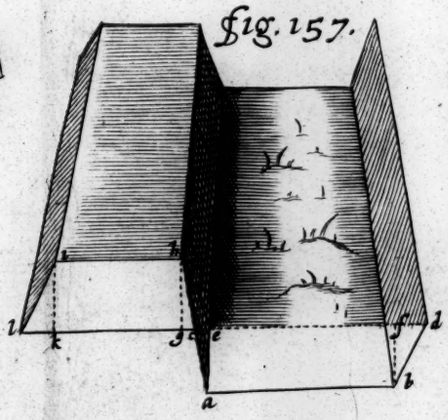


fig. 158.

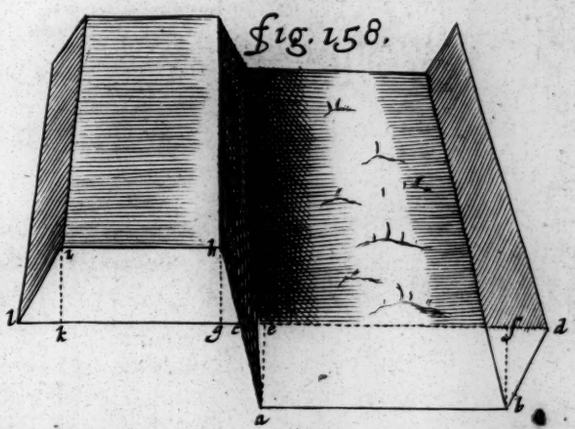
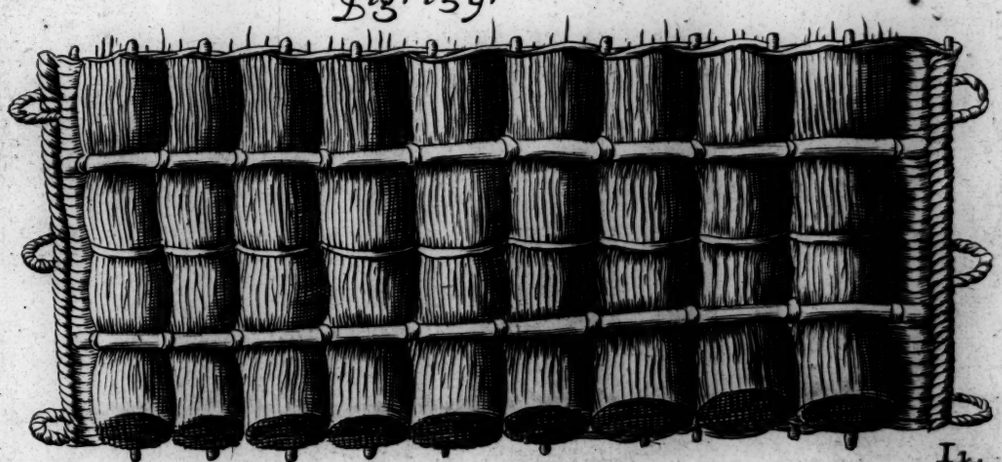


fig. 159.



The fourth Example.

Againe you meete ſometimes with a foundation, which one cannot paſſe through *dryshod*, and cannot get deepe enough into the Earth, but one is forced to approch in that manner as is repreſented in the figure 156 in taking the neereſt way, which may be to approch vnto the *Fortreſſe*, and the Approches is made of that Earth, which is digged about it, in ſtead of ſetting vp of *Gabions*, And as in the former Approaches the traverſes, and blinds were made of Gabions, ſo here they are made with whole Redoubts: in the midſt whereof there is a gape or a Sallie, made in ſuch ſort, that the one Redoubt is ioyned to the other, the greateneſſe of every *Redoubt*, being ſome ſix or eight Foote in length, and as much in bredth.

Such *Traverſes* are oftentimes made ſo ſtrong, that they are able to reſiſt a *Canon-bullett* when they have Earth enough, for ſometimes they are made ſixe foote, but the heigth of of them is not alwayes alike, ſeing they muſt bee made higher there, where moſt danger is.

The gates are made in ſuch ſort with a falling plancke, that they may bee drawne vp, and shut, and are of that height, and bredth, that a waggon may come through them.

It is a thing impoſſible to deſcribe all the maner of Approches, becauſe they are ſo mixed and of ſuch great diverſity.

Neither is the ordinary way of approches alwayes a like, becauſe the one are made deeper, and larger then an other: but commonly they are from 8 to 14 foote broad, and three or 4 foote deepe in the Earth, or their therabouts: the *Baſis* of the Earth layd vpon it, in ſtead of a parapet, ought to be betweene ſeven and eight foote.

Wee have propounded as an example for them two *Profiles*, marked with the numbers 157, and 158, whereof the greatneſſe, & meaſure of them, is noted with letters and numbers in this table following:

THE DEMONSTRATION.

	FIGVRE.	157	158
The Profile of the figure marked.			
The inferiour bredth of the Approch.	*AB*	9	12
The depth of the Approches.	*FB, EA*	3	4
The Talud or Slooping exteriour.	*FD,*	1½	2
The Talud inferiour of the approches.	*CE,*	½	1
The Bredth of the Approches above the Earth.	*CD,*	11	15
The Baſis of the Parapet above the Earth.	*LG,*	8	10
The Talud exteriour of the parapet.	*KL,*	1½	2
The Talud interiour of the parapet.	*GC,*	½	1
The height exteriour and interiour of the parapet.	*IK, GH*	3	4
The Top of the parapet.	*HI,*	6	7

We have expreſly omitted the foot-bancks, becauſe they are not made in the beginning of the Approches, which ought to bee made in the Approches after diverſes manners ſometimes this way, and ſometimes many as occaſion may ſerve.

OF COUNTER-APPROCHES.

THE SIXTH CHAPTER.

THe *Beſeigers* hauing approached neere vnto a Towne or a Fort, it behoues then the beſeiged to look well about them, and not to be idle, but ſtirring, and to doe their vttermoſt endeavour to hinder, and offend their Enemy.

The defence which is made againſt theſe Approches is rightly called *Counter Approches.*

This defence alſo is made after diverſe manners, firſt when the Beſeiged are a great number, ſo that oftentimes they are able to fall out, and make Sallies, which they ought to do as often as may be, notwithſtanding that they looſe men, which of neceſſity muſt happen; becauſe the Beſeigers are much more ſtronger then the Beſeiged, and haue farre more forces, then thoſe which are within the Fortreſſe.

For by this meanes the Enemie will be hindred, and his Approaches ſlowly advanced, being many times beaten back, and conſtrayned to retyre into his workes, during which *Alarme*, they cannot advance forward their workes, neither can they begin them againe, till the Beſeiged are retreated.

They ought to haue a ſingular care, when one makes a Sally, that their men be not expoſed to ſlaughter, but muſt be commanded to fall on with diſcretion, advantage, and profit, to the end that the Towne or Fort beſeiged be not bereft of their men by foole-hardineſſe, rashneſſe, and imprudencie.

For a Fortreſſe which wants men, may bee compared to an empty purſe which hath no money in it. It lies much vpon the endevour of the Horſe, which are in Fortreſſes, for making of Sallies, and which ought to fall out oftner then the Foote, becauſe they can fall on and retreate with more ſpeede, and though ſome be loſt, yet the hurt will not be ſo great, as the loſſe of foote, which muſt be husbanded, and ſpared as much as poſible may be, to repulſe the aſſault of an Enemy.

The ſecond manner of defence is made by *Canon*, which muſt play continually from all places vpon the workemen and approches, to doe them as much harme as poſſible may be, whence it comes to paſſe, that the Workmen are amazed and frighted, when they ſee many of their fellow workemen fall and ſlaine miſerably by the Canon, which will abate their courage, and make them worke more faintly: in ſuch ſort, that an Enemy is driven to leaue of their worke, till ſuch time as the offenſiue ſide haue made Batteries, againſt the Beſeiged.

But when it is not feiſible, they muſt be conſtrayned at laſt to breake vp, and quit the ſeige, otherwiſe if they continue, it wilbe exceeding chargeable to them, becauſe no men will undertake the work, but ſuch as wil be ſoundly payed for it.

For every man hazards his life, when Ordinance and Musketteirs play continually vpon him, and a man will not venter his life for nothing, but will ſell it at as deare a rate as he can: beſides in ſo doing, it prolongs the time for an Enemy, ſo that a Fortreſſe may ſometimes be relieved, or when Winter, or bad weather comes on, they may be forced to abandon the Siege.

The third manner is by makeing of all ſorts of *Outworkes*, and in takeing vp the Ground, whereunto an Enemie Approches, which may be made during the ſiege, and while an Enemie approaches, as by makeing of *Rauelings*, *Halfe-moones*, *Horne-workes*, *Tenailles*, *and Traverſes*: for all theſe workes may be made, while an Enemie advances his Approaches towards a Towne or Fortreſſe, but it were better they had bin made before the Towne was beſeiged, for the gaining of time, and ſaving of charges, which might be employed in other works.

The fourth maner is when the Beſeiged make Counter Approches, whereby they may reſiſt an Enemy that he may not get into the Outworkes and *Counterſcharfe* with his approches, where to hinder him, they muſt caſt vp ſome *Traverſes*, and other lines running them from

from their outworks, as it were to meete the Enemies works, and ſo make them get ground (as it were by peece-meale) till they come to the Fortreſſe: But nevertheleſſe one muſt obſerve well, that they muſt be carried and made ſo, that they may alwayes flanke vpon the *Beſiegers* workes, and approches, and that the *Approchers* may do them as little harme as as may be, alwayes making them ſo, that they lie open towards the Town, or Fort beſieged, from whence they are to be defended, and muſt be ſo carried, that they may giue no advantage to an Enemy, when he takes them in, and ſee that they may be flanked from the Town and Fort both with Canon and musket.

At the laſt ſiege of *Bergen vp Zoome*, there were many ſuch *Counter-approches* made wherewith the *Beſieged* gauled the enemy shrowdly, in ſo much that he was not able (not withſtanding the loſſe of abundance of men) to get a foot of ground of them, having cheſts in the Counter approches which plaied continually with muskettiers, & fires locks vpon the enemy, & caſting fireworks among them, taking up alſo the ground, & advantagious places before the Enemie could approch vnto them, which did disharten them much, for as ſoone as *Prince Maurice* of happy memory, came to *Roſendale* with his army to relieue the Town. *Marquis Spinola* ſeing no hopes of getting it, after the loſſe of twelve thouſand men, was driven to riſe without it, and to quit the ſiege.

OF ALL SORTS OF BRIDGES, ESPE-*cially, your flagg, or Bulrush Bridges.*

THE SEVENTH CHAPTER.

UPon an expedition of warre, when of neceſſity an army to paſſe were a River, or a brook, there are commonly carryed boates, or ſloopes upon waggons, as hath been taught before, having Beames, are boards, all neceſſaries laid in the boates to be vſed, firſt they take downe the beames, and poſts, & then the planckes, and boards, which is done in a trice, when all things lye in order, ſometimes they carry onely boates, and ſometimes onely planches. To make then a bridge over a River, firſt theſe Boates (as many as you ſhall have uſe off to laye over the River) are launced into the water, which are bound together with ropes, and faſtned with cables and anckors in the bottome over, which ſparres, and beames are layd, and then planckes and bords layd orderly upon them, for men to march over. There are likewiſe ſuch kinde of bridges made with great boates in Fortreſſes lying upon a River ſide, when an Enemy is feared, & where one dares not make any other bridge: For, it is drawn up every night like a *draw-bridge*, that if an Enemy had any enterpriſe upon that place, he might not paſſe over it.

There are made likewiſe bridges over the moates of the outworkes of a Fortreſſe: but an Enemy being approched neere unto the fortreſſe, having made batteries to beate them down, theſe bridges are broken down in the outworks, and ſaillie bridges made, to which they cannot doe much harme, for the making of which one takes ſome Barrels, or Hoggsheads bound about with iron, and pitched, unto which rings of iron are made faſt for to put poſts into them, by which meanes theſe Barrels are joyned together, and lockt one to another, upon which there are laid planks for men to paſſe over and repaſſe, & if one would take them up in the night, they do it in ſuch a manner, that they are ſoone ſundred one from an other. An Enemy cannot ſo eaſily ſpoile ſuch a bridge, becauſe it lies even with the wa- and if ſome part of it ſhould be shott a peeces, one may preſently help it againe, with other Barrels and poſts.

There is an other kinde of Bridge, over which one may give an aſſault, whereof ſome of them are borne upon waggons, and others upon boates, and are made after the manner of *Draw-bridges*, ſaving that they are lighter, & are drawn upon the waggons, or boates upon which they are laid, but when one is to uſe them, then they muſt take them down. Read the Treaſurie of the *Mechanick Secrets* of *Auguſtine de Ramely*: The Artilery of *Diego Vffano*, and the *Theater* of the Inſtruments of *Henry Leyſing*, which treate of theſe things at large.

But of all bridges none are found more neceſſary and uſefull, then thoſe that are made of flaggs and Bulrushes. For all others require great charges, eſpecially, when ſome Ingenier takes ſome old invention from an ancient Authour, and gives it out for a new one: for it is reaſon ſuch a one should be recompenced, becauſe of his invention, and afterward becomes a directour for the making of it, as though no other could be made, but that which he hath invented, and ſo by this meanes makes his benefit of it, and his count and reckoning according to his deſire, by making a bridge, at ſuch a high rate and charge, that makes his maſters purſe light, and his own heavy. But if you looke narrowly upon it, you shall finde it to be an old invention, as one caſt off, and ſerves for no uſe. The like doth happen here, for when yee conſider well many new invented Bridges, made with great skill and induſtrie, yet nevertheleſſe they ſerve for little or no uſe. But your bridges made with flaggs, or bulrushes, are nothing ſo chargeable, and yet nevertheleſſe of great uſe; we will ſhew here in few words, how they are, and in what manner to be made.

The matter whereof they are made is a rush called in Dutch *Bieſen*, in French a *Ionc*, in Latine *Iuncus*, and in English a *Bullrush*. This rush groweth in rivers, waters, and brookes ſome foure, five or ſix foote high, and is commonly found in brooke-pits, *Marras*, and wet places, eſpecially by Rivers ſides, whereof alſo many times houſes are thatcht. The nature of this bulrush is to floate above the water, and are uſed (being bound up in a bundle) when boyes learnes firſt to ſwime, putting them under their arme-pits.

This Bridge above mentionned is made with this rush after this manner following, when they are ripe and growne to their length, then they muſt be plucked up, and well dried, and when you would make ſuch a Bridge, you muſt binde up theſe Bullrushes in round bundles, or foure ſquare, whereof the ſides muſt be ſome ten inches braod, and about foure or five foote long.

Now having got good ſtore of them, one makes a hurdle of them enterlaced with ſmall withs, five foote broad, and 7 or 8 foote long. Upon this hurdle one layes, and bindes in order the bundles one after another. And afterward one takes two long ſtakes, a little greater then a pike, which is faſtened to the hurdle, drawing and binding theſe bundles faſt one to another, which are likewiſe bound with canvas. At the end of the hurdles one faſtens at both ends two or three rings made with withs, to joyn and faſten the *joyntures* of this bridge together.

Theſe kind of Bridges are of excellent uſe in Seiges, cheifely in places, where one is reſolved to take in a worke vpon a ſuddaine enterprize, and would not be at the charge of makeing a Gallerie.

When one is reſolved to take in ſuch a worke, thoſe which are appointed to force it, being well armed as is requiſite, being come to the brinke of the moate by the meanes of the Approches, which are brought thether, they ſend out before ſome venterous ſouldiers, which carrying this bridge launces it into the water, and ioynes the peeces together withall expedition (and while the musketteires giue fire as faſt as ever they can) till they haue laid it over the bredth of the moate, and faſtened it on the other ſide, which being done, the Souldiers goes over it, and ſtriues to enter by all means to take in the work, as they are commanded.

But if there be any mine made ready, they ſtay the putting over of the bridge, and the falling on, till the mine be ſprung, for feare of breaking the bridge, and that it might ſpring backward.

When the Beſeiged are reſolved to make a Sally, they may likewiſe make uſe of theſe kind of Bridges, all other Commodities and utilities neceſſity the mother of ſuch like inventions will ſhew you.

Now for the better underſtanding of all things touching theſe bridges aboue diſcribed, we haue repreſented them in the figure 159, where you shall ſee how they are made faſt on that ſide which is to come into the water.

But they are to weake where you are to put over a broad moate, ſuch as are before Townes and Royall Forts, over which one muſt paſſe, before they can come to the Wall, for theſe

ſerve

ſerue onely for ſome ſuddaine peece of ſervice, and therfore it is needefull to make uſe of ſome other invention called a Gallerie which are of excellent uſe though chargeable, & which wee will handle in the next chapter following.

OF GALLERIES

THE SEVENTH CHAPTER.

VEgecius in the 16 chapter of his fourth booke diſcribeth a certaine kinde of worke, which the *Ancients* called *Vinea*, and ſaith it was a worke made of plancks ioyned together, ſome eight foot high, 7 foot broad, and ſixteene foote long, the roofe or topp whereof was covered with boards, and hurdles interlaced together, and the ſides with Boughes, in ſuch wiſe that it could not be ſpoyled with ſtones, over which alſo was laid thick *Oxen hydes* newly killed, or coverlids of *Hair-cloath*, to keepe them from fyring (whence it hapneth, that we make uſe of ſuch coverings in our moderne warres, for to hinder the force and violenee of Gun-powder, becauſe they are not ſo eaſely ſpoiled by fire (as hath bin ſaid aboue) and theſe workes being in a readineſſe, one makes uſe of them to their advantage.

When they havv made good ſtore of them, then they joyne and faſten them together, and the *Beſeigers* being blinded and covered under them, begin their approches to the wals and ſapp under the foundation of them to make them fall.

There is no work which reſembles more rightly this invention, of the Ancients, then our moderne Galleries. The preparition, the uſe, the height, the bredth, are almoſt all alike, and do agree ſo together in all things, that we muſt needs confeſſe that our *Gallerie* is noe new invention, but was in uſe among the *Ancients*, and which of late yeares hath bin renewed againe.

For if one conſiders neerely their ſtructure: the *Vinea* of the *Ancients* was made with timber and plancks: and our Galleries for the moſt part are made with poſts aad plancks ioyned together. That had alſo poſts to reſt upon for its foundation, and this hath alſo great poſts to beare up the weight of the whole worke. The ſides of the *Ancients Vinea* was fortified againſt the force of the *Baliſts*, becauſe they were laid with hurdles and boughs, wreathed together: but our Galleries are covered with plancks and Earth caſt upon them, ſo that they cannot be ſpoyled by Canon. The *Vineas* were kept from fyring by the helpe of *Oxe-hids* wherewith they were covered, and the ſides of our Galleries haue Earth caſt about them, that fire-workes may doe them noe harme.

Theſe *Vineas* ſerved to come to the Wall, to ſapp it, butour Galleryes are brought to the *Baſis and Barme of a Rampart*, to make a Myne in a Bulwarke, and ſo to blow it up.

The height, and bredth of the one, an the other doe not differ much, but it ſeemes the length is differing, though in effect it differs not much For the *Vinea* the ioynts of them being faſtened one to an other were reaſonable long, but our *Galleries* are ſett up with planks and poſts, and as it were makes but one peece ioyned together.

Whence it appeareth, that our Gallerie is not wholly a new invention, but hath bene in uſe of old, though in ſome things it is altered and changed.

Wee will now take it in hand, and ſhew after what manner, it muſt be made with all the appertenances thereunto belonging.

When an *Approch* then is brought ſo farre, where a Sapp is to beginn not farre from the Town, or Fortreſſe beſeiged, and that one is ſapped to the Counterſcharfe, then one ſees how a Gallerie may be put over the moate. For the effecting whereof, one muſt make proviſion of many things neceſſarie thereunto, and firſt of all gett good ſtore of longbrush & bundles of boughs, to fill up the moate, with a great number of plancks & poſts ioyned & made together like a Gallows, all of them having one height and bredth, which are ſo framed and made by the *Carpenters* before they are brought down into the Approaches, that

one may either take them asunder, or pinn them together without any great labour, for being brought thither, where they are to be used. It is easely done, by marking the ioynts and peeces with one and the same number which they may fit, and ioyne together without any great difficulty.

Such a *Gallowes* hath fiue peeces, to witt two posts which stand upright one crosswise over them, which ioynes the other two together, and two props or Supporters of timber to bear the crosse post up. The two posts are set upright being eight or nine foote long and are cut halfe a foote in the upper end of them, for the crosse beame, or post to rest upon the other two posts, and to ioyne them together, and a foote and a halfe at the lower end is sharpened and set fast into the Ground, so that it remaines seuen foote high for the topp of the Gallery. you shall see the forme of it, sett out in the 160 figure following, whereof the length of them from *a b* and *c d* are each of them 9 foote long, and the bredth 6 or 7 ynches: the half of this breadth at the uppermost end of these two posts is cut the length of half a foote, to lay the crosse beame upon them, which ought to be cut in the like manner, having the length of ten foote, or thereabouts, for the longer this crosse post is, the broader will the Gallerie be, and the better for the souldiers to march five of sixe in front, when they are to give an Assault upon the breach, the greatnesse is answerable to the two others, being marked with *A C*. Now for as much as these posts are made in such a manner with joints, that they may soone be joyned together, or severed, they cannot be so firme, as those which are joined and pinned fast together by force, without being afterwards taken assunder, especially, becaus̄e of the great weight, which they are to beare, therefore there are props made to support the crosse post, as you may see by *E F* and *G H*, marked in the 160 figure, all which being done, and all the peeces joyned and pinned fast together as is fitting, every peece is marked, & holes bored through them to fasten them together in a little time, when there is occasion to have them set up.

Of the Bords, and Plancks for a Gallerie.

After this you must provide in a readinesse good store of *Fir-boards* & plancks, which must be as long as the two posts, or rather 4 or 5 ynches longer, so that if the distance between post and post be 5 foote broad, then these plancks must be five foote, and a half long: for the odd half foote is divided into two equall parts, takeing up three ynches on eyther side of the two posts, into which holes are boared, to naile the planckes and the posts fast together.

The ordinarie space between the posts ioyned together is commonly 4: or 5: (but seldome) 6 foote in bredth, which oftentimes is changed, according to the condition of the place, and as the danger is great or little.

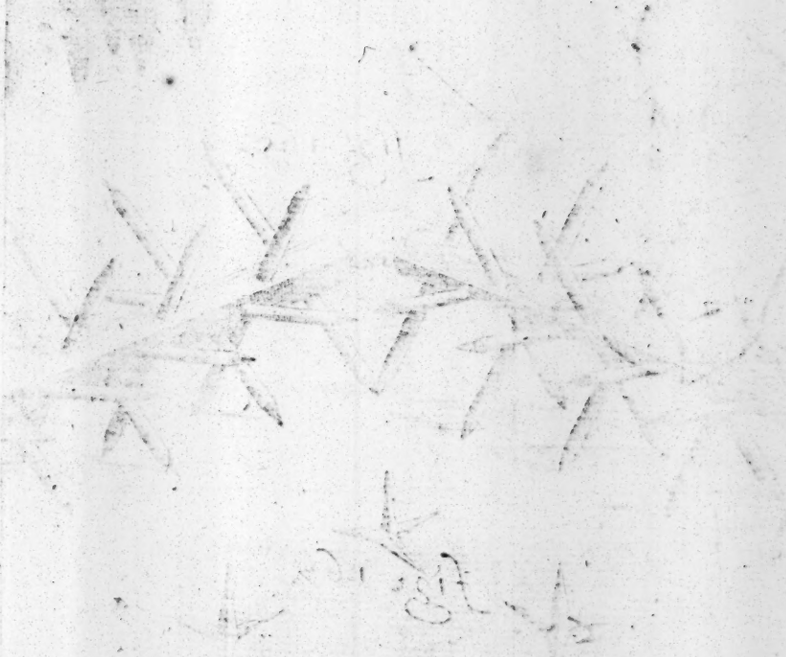
The thickneſse of the planckes is without any certaine measure, becaus̄e it is needlesse to make them all of one thickneſse, for it may so fall out, that sometimes you must use a thick planck, and some-whiles a thinner is fitter to stop a hole withall, as Occasion may serue.

Now for the ioyning and fasting of your posts together, you must provide good store of *Oaken-pinnes*, and boore all the holes with a *boorer*, to the end the holes may not cleaue, now all these pinnes ought to be of one bigneſse.

Also in *Galleries* there are used nailes some greater and longer, as you shall haue use for, some of them are 4 or 5 ynches long for to naile the plancks with, which covers the sides: some others 6 or 7 ynches long, which naile the props into the posts, you must haue good store of them of all sises for to use them, when neceſſity shall require. Your ordinarie *wheele-barrowes* and shovels are here of excellent use, but you must have *shovels*, that have longer hafts then ordinary to cast the Earth a good way into the moate, which cannot be so well done with short hafts.

In this place one ought to make use of thick planck-blindes, which wee haue mentioned in the Chapter of *Gabions* and blinds, which serve for a very good use in *Galleries*, as we shall show you hereafter.

A Gallerie



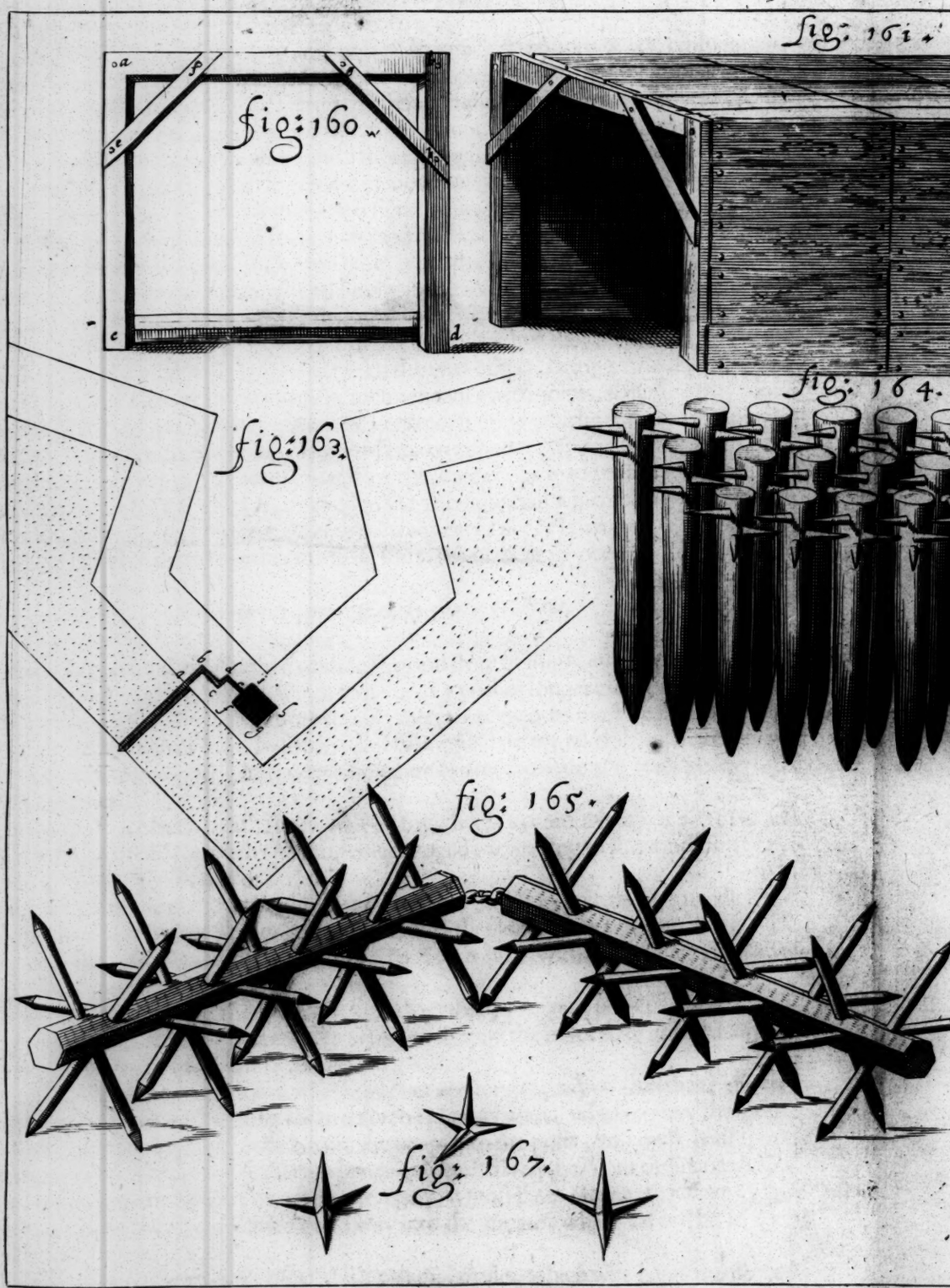


fig: 160.
fig: 161.
fig: 163.
fig: 164.
fig: 165.
fig: 167.

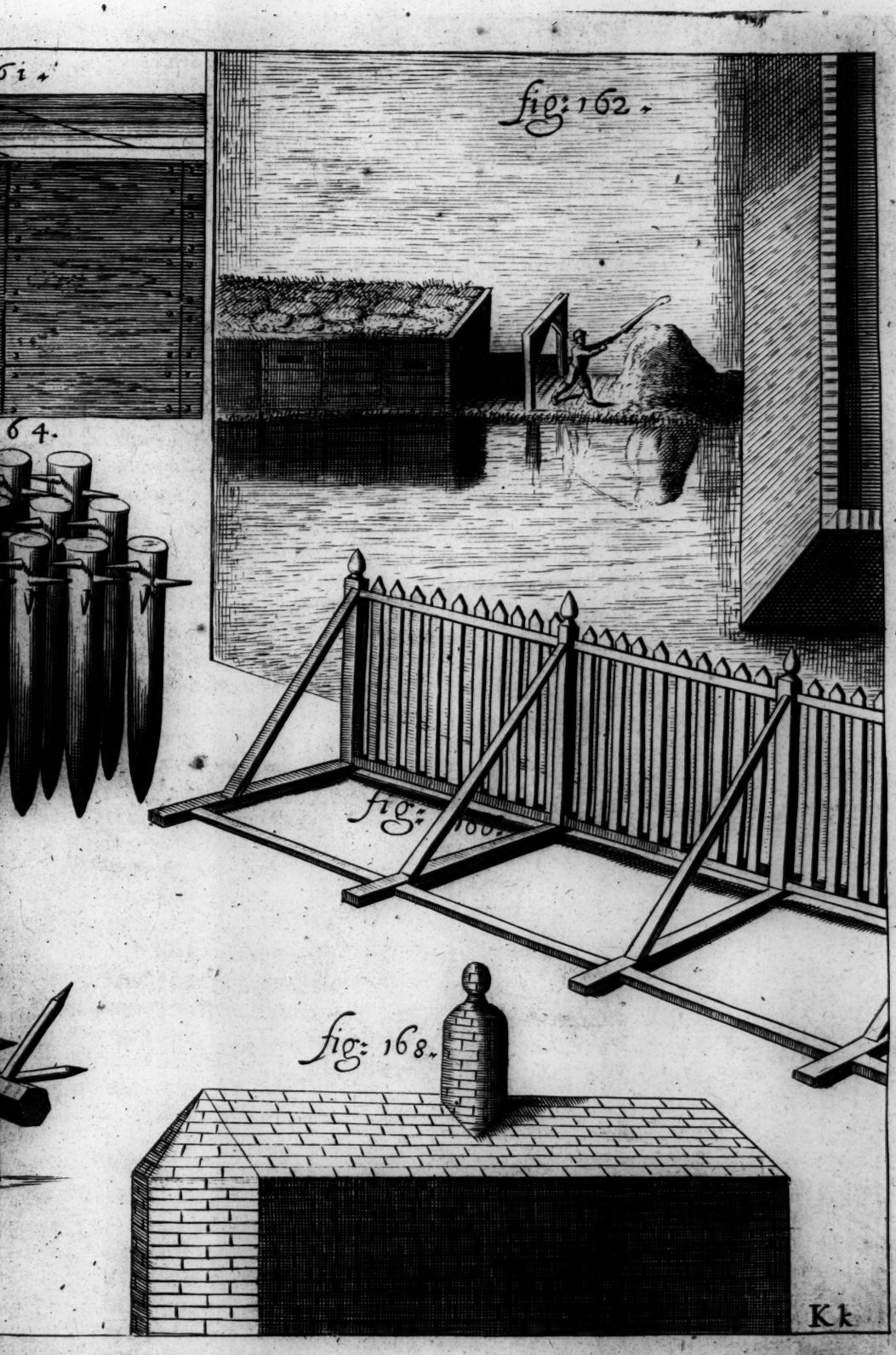


fig: 162.
fig: 168.

A Gallerie raiſed without, being covered with Earth, is repreſented unto you in the 161 figure.

After you haue ſapt through the Counterſcharfe, and that you are come to the edge or brinke of the moate, and reſolue to lay a Gallerie over it, you muſt firſt of all provide good ſtore of theſe bundles of long brush before mentioned, brought downe in waggons, and abundance of Wheele-barrowes, to fetch Earth into the Gallerie, to caſt theſe things into the moat, and to fill it up, even to that place, where you intend to make a *Mine*, and in ſo doing, you shall by degrees fill up the moate, and make a good foundation for your Gallerie to reſt aud ſtand upon.

But becauſe any cannot caſt and lay theſe brush faggots in order, as one would, you shall meete with ſome venturous ſouldier or another, who for money will adventure in the night to goe out at the mouth of the Gallerie into the moate, to lay them in order. And to the end they may not be ſeene by the Enemy, one muſt obſerue well to take the *perpendicular* of the face of the Bulwarke, which wilbe the shorteſt way to come unto it.

The moate then being filled with theſe long bundles, and fagotts of Brush abouesaid, ſo that one may caſt Earth upon them brought from the next ſapp, the workemen fetches good ſtore of Earth in wheele-barrowes upon plancks laid in the Gallerie, and brings it to the mouth of the Gallerie, caſts it upon a heape, and then two or three workemen which are apointed to worke in the mouth of the Gallerie, caſts it into the moate to ſettle the fagotts. This Earth caſt up in the forme of a heape, ſerues to cover and make a blinde for the workemen onely before, bnt not on the ſides, and therefore they muſt be conſtrayned to make blinds on that ſide which is moſt dangerous, till the poſts be ſet up, yea oftentimes they muſt make blinds on both ſides of the Gallerie, if an Enemy flanks it from two places. After this one begins to ſet up one of the poſts, ioyned and pinned together as hath been taught, and as you may ſee in the 160 figure. And ſets ſome men continually to fetch Earth in their wheeſe-barrowes, others from the top of the heape caſts the Earth with their Tong-shovels into the moate, and gets more ground to ſet up the other poſt, for having got a matter of fiue foote or thereabouts, they ſett up the other poſt ioyned together as is ſaid, after they haue ſet forward the blinds for to cover the ſides of it: which two poſts being ſet up, then they naile the plankes faſt to both ſides of the Gallerie, and they ſet onely the others upon it without faſtning them, by covering the ſide onely with Earth, which may be beaten downe by the Enemie, till it is able to reſiſt a Canon bullett, and then caſts Earth aboue the Gallerie, about a foot, or a foote and a halfe high, which muſt be ſpread, and laid even, to the end fireworkes, may not lie upon it, and ſpoyle the Gallerie by fyring of it.

It happens ſometimes, that one ſide of the Gallerie is out of the Enemies ſight, and cannot be beaten downe with their Canon, in ſuch ſort, that one needes not cover it with Earth and then that time and charge is ſaved, unleſſe it lies ſo, that an Enemie can ſett fire on it with pitch ropes and other fireworkes; or ſpoyle it with his Canon, which lies in his *Out-workes*, which being ſo, then of neceſſity, you muſt cover that ſide, till it is able to reſiſt the Enemies Canon.

And becauſe it would be very darke if the whole Gallerie were covered with Earth, and ſo very incommodious for the workemen, therefore to helpe that on the ſafeſt ſide, there are little windowes or holes made of a foote high, and a foote and a halfe long, betweene everie three or foure poſtes ioyned together, to giue light into the Gallerie.

This worke is continually advanced, and the heape raiſed by the workemen, which caſt the Earth into the moate in a greate quantity before them, haueing alwaies a ſingular care, that the heape from whence they caſt their Earth growes not too low, leaſt the workemen be diſcovered. Afterward they ſett up the third poſts ioyned together in the ſame manner as hath been ſaid, and naile faſt the boards, and planks to them, this labour muſt be continued till the Gallerie is advanced even to the very foote and barme of the *Rampard*.

All which is showne in the 162 figure where a Gallerie is made & covered, as alſo to show that one of the poſts ioyned and ſet up, which muſt be nailed to the others with plancks, and the heape of earth behinde which the man ſtandes and works, is alſo here pourtrayed out.

When the Gallerie is brought over almoſt to the very foote of the Rampart, then one may come to it with more ſafety, for then the Heape is taken away, and a blinde made of thick Oaken plankes to begin a mine into the Bulwarke.

At the lower end of theſe poſts abouesaid, as you may ſee from B to D, there is an other poſt beſides of the ſame greateneſſe, which cannot be ſeene, therefore wee haue purpoſely omitted it, but will remember to ſpeake of it, when we handle the makeing of the poſts and paliſadoes.

THE EIGHTH CHAPTER.

OF MINES.

AS a *Gallery* is an ancient invention, ſo likewiſe *Mines*, which we make at this day, haue been heretofore in uſe amongſt the *Ancients* alſo: and this is the laſt thing wherewith the Beſieged are troubled.

A *Mine* then according to the definition of *Vegecius*, is a *Cave* by which one makes *ſecret goings* under the Earth, to come by night unawares to a Fortreſſe, or by which one diggeth into the foundation, and bowels of a wall, or of a Bulwark, underpropping the earth with poſts of wood, and laying under it dry wood, for when they would make a hole in the wall, they ſet fire on this wood, which being burnt with the props, the wall fell down, and the Beſiegers being in a reddineſſe attending the fall of the wall, ran preſently up by that breach, to aſſault the Fortreſſe; which is underſtood alſo of our moderne *Mines* which we make in, by blowing up the powder that is laid in them, whence it appeareth clearly, that this is alſo an ancient invention, being a little changed, and amended at this day.

This mineing (or digging under the earth) is called in Latine *Cuniculus*, of which name ancient Writers, as *Iulius Cæſar*, *Livius*, and *Curtius* make often mention of in the deſcription of this *Stratagem*, it ſignifieth a Moole from whence the name is taken, becauſe the Mines made under *Rampards* and *Bulwarks*, reſembles the holes and paſſages, which mooles makes under the earth. There are others which derive this name from the Latine word *Cuneus*, becauſe the Mines are made in the fashion of a *Wedge*, which is thick at the beginning, and diminisheth little by little, even as the Mines which make a rupture in thoſe places where they are made, may be compared to a wedge, which cleaveth a piece of timber in ſunder. *Mines* were of old called *Cuniculary*. He that is deſirous to know more thereof, let him read *Vegecius* and *Vitruue*, who have written of Military inventions among the ancients.

We will here deſcribe in a few words, how our *Moderne Mines* are made at this day.

The laſt meanes for the forcing of an Enemy beſieged, to make him yeeld, is this making of a Cave or Mine under the earth, which is begun and finished (as is ſaid) after you have brought your *Gallery* over to the *Barme*, or foot of a *Rampard* or Bulwark.

But before it is begun, you muſt have all things neceſſary, and in a reddineſſe, for the effecting of this work, firſt of all ye muſt have Spades, Shovels, Pickaxes, and all kinde of Maſons tooles, with all things requiſite to pierce and break the wall, wherewith the Rampart is made.

Afterward, one prepares props to ſupport, and beare up the Mine from falling or ſinking, being two, or two inches and a halfe thick, the length of them being not alike, becauſe the entrance into the Mine is made higher then towards the end of it. One is furnished alſo with firre planks, for to line the Mine within, as above, that it may not ſink and fall down, for it muſt be ſet with planks on all ſides, as well as the foundation, eſpecially if the earth be moulding and wettish.

But before you begin to make your Mine, it will be neceſſary that you know the condition

tion of the place, that is, whether the Bulwark be hollow and vaulted, or whether the foundation be laid with Branchages, Logs, or borne up with Piles: and whither water may not ſpoile your Mine, if you should mine too low. In caſe that the Rampard or the Bulwark into which you intend to mine were laid with logs, or ſupported upon great Piles, which happens ordinarily in moorish and rotten places, upon which you muſt build your Bulwarks, and Rampards; or when one can get no other Earth but ſand; you muſt try and get out all theſe Piles with Cables or ropes, by winding them out with an inſtrument ordained for this purpoſe. Now you muſt pierce and pull out theſe loggs by ſuch wayes and means as is known unto Miners, for the making of a way, and a chamber to lay your Gunpowder in. When you are aſſured that you cannot digge no deeper, but that shall come to water, then you muſt raiſe your Mine a little higher, to the end the powder may lie dry in it.

The Miners then beginning to break into the wall, do carry their Mine ſo cloſe, and ſecret as poſſible may be, that the Beſieged may not heare any noiſe, or gather any notice, where the mine in made, and how it runs: for if they do, without all queſtion, they will make a *Counter-mine* to diſcover and ſpoile your Mine begun, ſo that you shall be driven to begin a new one in another place, as hath hapned many times.

The heighth, and the bredth of the *Mine* muſt be made in ſuch a manner, as you may onely lay in the Barrels of powder, for it ought to be no higher, nor no broader, becauſe your intention is, but onely to chamber your powder in it, and therefore it muſt not be ſo high as a man, and no higher, but that a man may onely work in that upon his knees, and that he ſtoops lower, when he goes to lay the powder into its chamber.

The heighth then muſt be but 4, or 4 foot and a half high at the moſt, and the bredth but 3 and a half; or foure foot, according to which meaſures, the props and the planks are framed, wherewith you are to underprop the Mine.

When you begin to mine into a Rampard or Bulwark, you take out the earth, and carry it away in a veſſell, or a pall of leather, which is light, in handing it one to another, till it be brought out of the hole, or entrance into the Mine, and laid in the Gallery, to the end the Enemy may not ſee it, and geſſe whereabouts your Mine is.

The *Maſter-Miner*, which hath the conducting of the Mine, ought to be a man of great experience, how he ought to carry it, leſt he be miſtaken, and ſo make it in a place, where he ought not to make it. Therefore he muſt have knowledge of a *Compaſſe*, and how the *needle* ſtands, that he may carry his Mine aright. He ought alſo to have skill in *Geometry*, to the end he may know of what heighth he muſt carry his Mine, according to the proportion of the Rampart.

The nearer he comes unto the place where he is to make his Chamber, the narrower ought the way of the mine to be, in ſuch ſort, that it muſt be no broader or higher at the entrance into the *Chamber*, but that a Barrell of powder may ſcarcely paſſe through the way, for the ſtraighter and the narrower the paſſage is into the chamber, the eaſier the Mine is ſtopt.

The place where the Chamber is, ought to be ſo made, that the powder doth not break neither the one, nor the other ſide, but that it may blow the earth upward. Nevertheleſſe ſometimes the Miners are commanded, to make their Mine ſo, as it may blow the earth into the Fortreſſe, or elſe without which may be done, if they make that ſide, which is to be blown up, not ſo thick as the other: for the nature of powder is ſuch, that it maketh the greateſt operation alwaies towards the weakeſt place, and though it blows it up ordinarily: yet commonly it ſearcheth moſt often the place, where it may break out ſooneſt into the ayre, which appeareth both in your Canon and Muskets.

The bigneſſe of the *Chamber* is divers, for it muſt be made according to the greatneſſe and proportion of the wall or Rampard: nevertheleſſe one muſt obſerve, that it be made as narrow as poſſible may be, and yet muſt have room enough to lay the Barrels of powder into it: the ordinary heighth is ſome ſixe or ſeven foot, and the bredth foure or five foot.

When the Chamber is ready, then you lay in your Barrels, the number whereof cannot be ſo preciſely diſcribed. For one Rampard is greater then an other, in ſo much, that a grea-

ter quantity of powder is requiſite more for one place then an other. The common opinion is, that a Barrell of powder will blow up a rod, or twelue foote of Earth. The Barrels are layd in ſuch order, that in the twinckling of an Eye, they take fire all at one time, which cauſeth a greater operation, then if one Barrell should be blowne up one after an other. After that your powder is chambred, then with all expedition you muſt ſtop the entrance into the chamber, with thick and ſtrong planckes, and ſtop it hard, and ramme it in with good Earth, and leaue a little hole or traine, to lay ſome powder in it, which traine is carryed to the very end of the mine, and ſtops up the paſſage of it with firkins of Earth, that the aire may neither come in or out. For the ſtronger the Mine is ſtopt, it will take the greater effect. All things then being in a readineſſe, it is left ſo till one is commaunded to giue fire to it.

In the 163 figure is repreſented unto you a myne marked, *A B C D E*, is the way upon the Bulwarke, *E* is the entrance into the chamber, *F G H* and *I*, is the chamber it ſelf, wherein the powder is laid.

Here a queſtion might be moved, whether mines ought to be carryed with right lines, or crooked? The anſwer is, that mines, which are carryed in a right line are ſooner made, but becauſe they take not ſo good effect, the other are to be preferred before them, which are made with oblique lines. For the windings and the turnings of them, adds ſtrength vnto them, that the powder hath not ſo much force to breake the ſtopping. Now ſuppoſe that it should breake the ſtopping *D : E* : the reſt therefore is not broken, becauſe the force of the powder is kept in by the Earth marked *D*, and driven back to blow upwards, or finding no vent to turne back againe, where it was layd. But in a right line when the powder breakes the ſtopping, the effect thereof is hindred and diminished, for it is certaine, that the ſtopping, which is made newly is not ſo firme as the old ſetled Earth, which hath lain a long time in it.

OF

OF COUNTER-MINES

THE NINTH CHAPTER.

WHere there is an *Offenſiue* Warre, there is alſo a *Defenſiue*, as appeareth by mines: for the Beſeiged having diſcouvered them, which one hath prepared for them, and that there is no hope left, but waiting for the Springing of an Enemies myne in their Rampard, and to giue them an aſſault, then they are to ſtand upon their defence, and beginn to make mines alſo, which they eyther doe to offend an Enemy, or to defend themſelues by them. Therefore wee muſt underſtand here, three kinds of mines to wit, the workes which are made to finde out an Enemies mine, 2: The Counter-mines, which are made to ſpoyle an Enemies mine, & 3 the cutting off of a Bulwarke or a *Rampard* within, of the two former, wee will treate in this Chapter.

For the firſt kind of Countermines, wee underſtand thoſe workes, and mines, which are made to diſcover, and find out an Enemies *Mine*, and to kill the miners in it.

After one hath found it out, as alſo for the caſting down of the ſame work, and the taking away of the powder chambred, the Enemy will finde himſelf deceived, when he thinks to ſpring his Mine, attending the operation thereof in vaine, becauſe the powder is ſtolne out of it.

For to finde out an Enemies mine, there are two manner of wayes, the one which was uſed by the *Ancients*, and the other practiſed at this day.

Vitruvius in the ſaid Chapter of his tenth book, deſcribeth the maner of the *Ancients*, and ſaith that the Cite of *Apolonia*, being beſieged, and the Beſiegers having made ſome Mines under the earth to aſſault the Citizens, on a ſudden within the walls; the Citizens being advertiſed thereof, were extreamly affrighted thereat, and began to faint and loſe their courage: becauſe they knew no remedy to prevent it, and could by no means finde out the place where the Mines were made. But *Tryphō Alexandrin*, which lived in that age, the *Architector* of this City, cauſed to be made along under the walls a great many ditches, and withall ſome Mines under the walls continuing them beyond the Enemies, as farre as one could throw a ſtone. He cauſed to be hang in theſe ditches veſſels of Copper, under thoſe places, where the Enemy wrought, which made a noiſe, by reaſon of the moving of the earth, whereupon he found out the Enemies Mines, and filled Cauldrons of braſſe full of boyling water, and melted pitch, to powre it down through holes upon the heads of his Enemies mines. He caſt down alſo mens dung, which was mixed with hot ſand and gravell, which he did by night into the Enemies Mines, into which he had made divers holes, and by this meanes ſlew a great many of them.

Herodotus in his *Melpomina* makes mention of a *Tinker* which dwelt in the City of *Barca*, beſieged by the *Perſians*, who diſcovered the Enemies Mines by the meanes of a Buckler of Braſſe, which he hung in divers places againſt the wall, and ſo found out at laſt the place under which the Enemy mined.

But at this day to finde out an Enemies Mine, they uſe to make counter-ditches, as hath been ſaid, and before a Mine is begun, it is neceſſary to be informed, after the manner of the Ancients of the place, which may be undermined by an Enemy. But Mines are ſearched out after divers other wayes.

Some are of the opinion, that round about the walls, and Bulwarks of a Town or a Fortreſſe, (to wit, when the fortification is firſt begun) one ſhould make hidden caves and paſſages under the earth, by which one might diſcover, and finde out an Enemies mine. But this me thinks is not good, becauſe the walls and Bulwarks are made thereby prove weake, and theſe caves being made with poſts, and planks, which in tract of time are ſubject to rot, and then the Mines afterward falling down, all that labour is loſt. Alſo it is dangerous to make vauts in Rampards, and Bulwarks, ſeeing it is to be feared, that ſuch a work is not durable, ſith it muſt bear up ſo great and ponderous a weight, beſides it will coſt exceſſive expences. And though theſe Countermines should be thus made and ordained: yet it is not certaine,

taine, but that an Enemy in myning may meet iuſt with one of theſe Mines, and ſo take his way and advantage, either over or under it, and ſo leave this Counter-mine alone.

A ſecond opinion is, that ſome findes it good, that one ſhould hang trees, and other bushes in them, which are found often in the Rampards of the *Cimbri*, which being ſtirred with the leaſt motion, gives a ſound, whereby one may finde out the place where the mine is. But this is a thing uncertain, becauſe the leaſt gale of wind, will eaſily shake theſe bushes and branches of trees. And if they do, it muſt be done in a ſtill and a calme weather, when there is no winde ſtirring. And therefore I anſwere, one ought to ſearch out an Enemies mine at all times, for it were an abſurd thing, for one to ſtay from finding an Enemies mine out 'till a calme time comes, who will advance (as much as poſſible may be) his work, without ſtaying for ſtill or faire weather. Therefore this way ſerves but for little uſe.

A third and a better way, and which is the ordinary way, is to ſet a drum in the place ſuſpected, with ſome Dice, peaſe, or beanes vpon the head of it, which upon any ſtirring, will leap upon the drum, when it ſtands over the place where one works. Nevertheleſſe you muſt not let it ſtand in one place onely, but remove it now and then from one place to another, yea ſo often, that you are aſſured of the place, which is shaken by the work which is made under it. Some make uſe of a Baſon of litany filled with water, and imagines, that the mine is there, where the water moveth, but that is uncertaine as that of the *Cimbri* is, ſpoken of before, but that of a drum is held to be the beſt and ſureſt way. Notwithſtanding one may make good uſe of Baſons, when they are ſet upon a *Rampard*, as a drum with peas or other things. For by ſuch a meanes one may know the place, which is undermined. The uſe of Baſons without all queſtion, took its Originall from the Invention of a Kettle, whereof wee haue ſpoken even now.

A fourth opinion beſides theſe which is in uſe alſo; is a great long iron Borer, to bore into the Earth, wherewith thoſe which ſearcheth the Earth, bores a hole with it into the *Rãpard*, & laying his eare to the hole to liſte well if he can heare any noize, which is practiſed in ſuſpected places. Many other Inventions are invented by neceſſity the mother of practiſe.

To reſiſt then the mines of an Enemie, one makes uſe of this practiſe following. After you haue curiouſly ſearched out the Enemies mines, and that you are aſſured of the place under which they are hid then you may find them out without all queſtion, and nothing remaynes then, but to make a *Counter-mine* againſt them, which is made in the ſame manner as we haue diſcribed in the former chapter, treating of mines, to wit, by underpropping the Earth with poſts and laying plancks betweene them, that the Earth may not tumble down. Now becauſe one is not aſſured to meet iuſt with the Enemies myne, which may be made either too high, or too low, therefore you muſt make many, till by one of them you haue found it out, and are come to the *Chamber* to take away the powder.

When an Enemies myneis carryed ſo ſecret, and hidden, that one cannot finde it out, then the beſieged muſt of neceſſity reſolue to quit that part of the *Rampard* or Bulwarke under which they ſuſpect there is a mine, and to cut it of inwardly. But for their advantage they make ready alſo their *Countermine* made in that place, & chambers their powder attending the effect of the Enemies mine, and when he ſprings his mine, then they retire themſelues into their new worke cut off, and the Enemy being lodged in that peece of the Bulwarke or Rampart, which they haue quitted, then they blow up their *Countermine* and ſlay all thoſe, which they find in it.

The like alſo is done in outworkes and Counterskarfes, when one is driven to quitt them, and that one cannot keepe them any longer.

OF

OF PALISADOES: PALES: TURNE-PIKES: BARRICADOES, QUADRANT-TANTERNAILES: AND BEARES.

THE TENTH CHAPTER.

WEe haue often made mention of *Paliſadoes* and the uſe of them, eſpecially when they are ſtruck into the ground about dry moates, for then they ſerue, in ſtead of water againſt the ſudden aſſault of an Enemie, ſo that not onely the moates before great walls, and Rampards, ought to be ſet with them, but alſo all Outworkes muſt be fortified with them.

They are likewiſe of excellent uſe in the Field, when trenches are ſet round with them, and ſtruck in round about Forts, and workes, which lie in the moſt dangerous places.

They are of no leſſe uſe alſo in Fortreſſes, eſpecially when the Beſeiged are conſtrayned to make cuttings off within a towne, or Fort: moreover they are good to be ſtruck in upon the topp of Breaches, whereof we will treat in the next chapter.

Theſe *Paliſadoes* then are made in this manner following. one makes choiſe of good and ſtrong *Sparrs* being ſome 3 or 4 ynches in *Diameter*, but of ſeverall lengths, according to the place into which they are to be ſtruck, whereof ſome of them may be 5;6, or 7 foote long. Now the lower end of them muſt be sharpened and pointed, and the upper end flatt, that they may be driven into the ground with a mallet or a beetle: one bores alſo a hole ſome 3 or 4 ynches under the head of the *Paliſadoe*, and an other ſome three ynches under the firſt hole, and a third hole on the ſide through the middeſt of the two others, in ſuch ſort, that the nailes, which are driven through it, reſemble as it were the corners. In ſome alſo they uſe to driue in two nailes, ſo that they are not ſtruck in a right *Angle*, but riſes a little towards the head of the *Paliſadoe*. The length of theſe nailes, muſt be ſome eight or twelue ynches, and ſo bigg, that they cannot be eaſely bowed or broken, and the *Head* which is driven into the *Paliſadoe* is ſome-what greater, then that which ſticks out, which ought to be very sharpe.

When you are to uſe theſe *Sparrs*, whereof you muſt haue good ſtore, you take firſt of the ſhorteſt ſize, being but fiue foot long, and ſtrick in a long ranke of them, as you ſhall finde neceſſarie. They are driven into the ground the depth of a foot and a half, or ſometimes more, according as the Earth is conditioned, and thus you ſhall make your firſt ranke: then you ſhall driue in an other ranke of *Paliſadoes*, being ſix foote long, which are ſet behind the firſt ranke, to the end they may run in a right line with the firſt, but muſt be ſtruck in a little ſidelings, to the end, that their nailes may fill all places neceſſarie, and the heads of theſe *Paliſadoes*, ought to ſtand about halfe a foote higher, then the others: In the ſame manner you driue in the third ranke, which muſt be half a foot higher then the ſecond, and thus you may doe, if you will driue in a fourth ranke, yea as many as it pleaſes you. Theſe *Paliſadoes* are repreſented unto you in the 164 figure.

For the *Paliſadoes*, which are uſed againſt aſſaults there are two ſorts of them. The firſt is that ſort of *Paliſadoes* which are ſett upon the *Parapets* of Forts, *Outworks*, and *Redoubts*, for to hinder an Enemy that they may not ſo ſoone aſſault or ſcale a place: theſe ought to be 3 or 4 ynches in *Diameter*, and ſome 6 or 7 foote long, whereof the half paſt is driven into the *Parepett*, and the other half ſtands upright.

For the other ſort, thoſe great headed piles or pales, claſped together with chaines, and plates of yron, which ſtand alwaies upon *Rampards* and Bulwarkes covered with a little roof, againſt the time of neceſſity, when as an Enemy ſeekes to aſſault a Fortreſſe. For by this meanes he is repulſed, when he would ſcale a Rampard, becauſe theſe *Paliſadoes*, or logs

being caſt downe a wall, annoyes greatly the Beſeigers, in regard of their weight, which they are not able to reſiſt, though they be armed with head peeces.

OF PALISADOES, PALES, VRIZ-RUYTERS, CAVALLIERS DE FRIZE,

Called in English Turne-pike

THE TENTH CHAPTER.

WEe haue obſerved in our declaration of Originall names whence, the *Cavalliers De Frize* tooke their name: to wit, at the ſiege of *Groeninghen in Frizeland*, where they ſerved for great uſe, by ſtopping and hindring the Enemies horſe, when they came to relieue the Town, and then got this name of *Vrize ruyters* in Dutch, *Cavalliers de Frize* in French, and *Frize Horſes or Turne-pikes* in English, and beſides the ſtopping of a ſuddaine charge of Horſe, they are of excellent uſe, to be clapt on the topp of a breach, or ſome weake place of a Trench, or a wall, and good ſtore of them ought to be carryed along with an Army on waggons, to be ſett up in ſome *Avenus*, or paſſages, to ſtop and hinder the ſudden attempt of an Enemy, when one hath no time to caſt up a trench.

In Fortreſſes they are alſo of greater uſe then chaines or Barres, which croſſeth the ſtreets. For a man may skip over a chaine, and a good Horſe will leap over it: But being beſet and croſſed with *Turne-pikes*, neither Foot nor Horſe are able to paſſe over them, ſeeing they have ſtaves and sharp points through them on all ſides. They may be ſet up alſo in the ſtreets of *Suburbs* and other places in ſtead of Barres, and where ſome broad places are to be kept, in joyning many of them together, which is done ordinarily in the expeditions of Warres.

They are made in this manner following, you take a tree of firme wood, which will not cleave, whereof the *Diameter* is five or ſixe inches, and ſome 10, or 14 foot long, which is made with ſix corners, ſo that it hath ſix ſides, and in the midſt of theſe ſides, one bores three or foure inches one from another croſ-wiſe, and then puts through theſe holes round Javelings, whereof the *Diameter* is an inch and a half, or at the moſt two inches, the length of them is ſixe or ſize foot, and ſo made, that they are all of one length, which are made of a ſtrong and a firme piece of timber, which will not eaſily bend, nor will be weakned by raine, theſe are thruſt through theſe holes, ſo that they are of a juſt length on both ſides, and have as many Javelings on the one ſide, as on the other: ſo that the *Turnepike* is alike over all, and falleth alwaies after one fashion, as it lies, and as one would have it. Both the ends of theſe Javelings are headed, and sharp pointed with yron, and the ends of the tree are plated about with rings of iron, that the tree of the *Turnepike* may not cleave, and in the middeſt of both ends there are rings and claſps made to tye two or three of theſe *Turnepikes* together with chaines, if occaſion ſhould ſerve, all which is repreſented in the 165 figure.

Where there are ſome *Banks* near unto a Fortreſſe or water, where Shipping may paſſe to and again, or where a water may be waded through, there are made pales or *Barricadoes*, repreſented in the 166 figure, which are made with Sparres of ſtrong wood, ſquared out, being ſome 4 or 5 inches big, and ſome nine or ten foot long, which are ſet between 2 great poſts, about 5 or 6 inches one from another, as ye may ſee in the 166 figure.

The foureſquare *Tanternailes* is a very neceſſary thing for defence, having alwaies one of the points ſtanding upward. For they have foure points as sharp as a naile, whereof three ſtands upon the ground, and the fourth howſoever it lies, ſtanding bolt upright. They are of divers greatneſſe, for thoſe which are commonly uſed in this Country, are leſſer then

thoſe

thoſe which are caſt into a Moate. The point whereof is 3 or 4, or 5 inches long. A Fortreſſe ought to have good ſtore of them for to caſt them into a moat, into a falſe bray, or upon a *Breach*, becauſe they do prick and hurt ſhrodly the Souldiers feet which ſtrives to enter. They are repreſented to you in the 167 figure.

Your *Dodanes* or *Beares* made of ſtone or brick are ſet upon a banke by a river ſide, to keep the water from overflowing, (or running out of a moat. The Dutches calls it a *Beare*, becauſe it repreſents the shape of a *Bearé*, but the French terme it *des d'Aſnes*, and of one word corrupted *Dodanes*, that is, *An Aſſes back*, becauſe it hath ſome reſemblance of an Aſſes back, upon which diſobedient Souldiers, who committed ſome notable offence muſt ride upon ſome houres one after another, which we call in English a *Woodden horſe*, and hath the fashion of an Aſſes back.

Maſter *Simon Stephens*, Prince *Maurice* his old *Mathematician*, in his new book of Fortification, and Sluces, makes mention of ſome great faults committed in the making of theſe *Beares*, becauſe the foundation, which should ſuſtaine and beare up this *ponderous* Worke, ought to be exceeding ſtrong, and ſoundly laid, for otherwiſe the expence, and the labour which it coſts wilbe caſt away and in vaine. For the preventing whereof, he giveth good councill to ſinke into the bottome of the moate, piles or *Maſt trees* bound faſt together, and of one, and the ſame bigneſſe and length, which will make a ſtrong and a firme foundation, whereupon afterward you may build your *Beare*.

It muſt be made a good deale higher, then the water, when the tides, or the rivers are ſwolne up to the very bankes, and it muſt be made ſo thick, that it may be able to reſiſt the force and violence of the water, and the ſtones and brikes ſo laid and plaiſtred together, that the water cannot eate or ſoake through it. And becauſe theſe *Beares* in moates might ſerve as a way to ſtraddle over and get into the Towne or Fortreſſe by, at both ends there is two *paliſſadoes* ſett the one upon the *banke*, and the other one heither ſide next the *Moate*, as you may ſee in the 166 figure, before which alſo is ſtruck into the ground, many other ſmall *paliſſadoes* of 4 or 5 foote length before mentioned. But the topp of the Beare is made with a sharpe Edge, and in the midſt of it a little round *turrit*, to hinder, and keepe back thoſe that would clime over it: Some times there are made two round turrets when it is made over broad water or moate, the figure 168 will shew you the *pourtrature* of ſuch a Beare.

OF RETRENCHINGS, OR INWARD CUTTINGS OFF, AND HOW ONE MVST RESIST AN ASSAVLT.

THE ELEVENTH CHAPTER.

Interiour.

THe Art of *Fortification* is not onely of perfect Fortresses, provided with all kind of *outward workes*, but also hath besides an other use, seing that it teacheth also how one ought to prepare and furnish a Towne or Fortresse with new workes, When the others are ruinated. This part of *Fortification* is called in French *un Retranchement Interieur*, in Latine *Recessus*, and in English *an Inward Cutting off*: because such works are made to no other end, but to make a Retrate into, when the others are lost. For, when one cannot maintain, and defend a whole worke, or a part thereof, because an enemie striveth with all his power to become master of it, one must then resolve, when he is driven out of one worke, how he may retire into another, and defend himself againe, against the assault of an Enemy, because it would be very hurtfull to defend one self, when he lies open to an Enemie.

This *Inward Cutting off* is of two sorts, the one in *outworkes*, the other in a *Fortresse* it selfe.

Besides, it is in *Generall*, or *particular*.

Wee will first handle the Cuttings of which are made in outvvard vvorks, vvhich are the first, vvhich an Enemie seekes to take in, and afterwards the Cuttings off, vvhich must be made in a *Towne*, or *Fortresse* it selfe.

Touching a *Generall Cutting off*, it is onely used in *Crowne-workes*, *Horne-workes*, or *Tenailles*.

The same is also of tvvo sorts *Regular*, and *Irregular*.

A Generall cutting off is, vvhen a vvorke is made in all things like unto that, vvhich is *cute off*, in such sort, that a *Crowne-worke* is made vvithin a *Crowne-worke*, a *Horne-worke* vvithin, a *Horne-worke*, and a *Tenaille* vvithin a *Tenaille*.

Irregular cuttings off of outvvard vvorks is that vvhich is that vvhich keeps not the forme of the vvorke, vvhich is cutt off vvithin, yet nevertheless shutteth up the vvork vvith a continued Parapet.

A particular cutting off is vvhen a vvorke is made out of broken vvorkes, or severed one from an other, in such vvise that there is made one, two, or three *Ravelings*, in stead of a *Horne-worke*, or tvvo *demy-Bulwarkes*.

You must observe vvell, touching every kinde of cutting off here set downe, that they may have a good defence, and if it be possible, that they may also be defended from some other places, and that they lie open to that side vvhich lookes into the *Towne* or *Fortresse* besieged.

A *Generall Cutting* off in *Crowne-works* is done as followeth, one fills backward some 20 or 24 foote, yea more or lesse, according as the condition of the place is, and as necessity require, and one makes a worke within it, like unto the other which is cut off. And though his worke being cut off, is lesser then the other, yet it will give an Enemy enough to doe when he shall attempt the taking of it in. Your *Crowne-workes* are made commonly after the proportion of a small *Fort Royall*, where the proportion of the *Polygones* are of 55, 50 or 45 rodd: When you resolve to cut off a work a little more inward, it will become narrower, in a regard of the great work, yet will be great enough to defend it self.

The Generall Cuttings off of *Crowne-workes*, will cost no great labour, which may easily bee showne, in regard it is very common. An example thereof you may see in the 169 figure: The cutting off being made, one is forced to make a ditch, between the worke quitted,

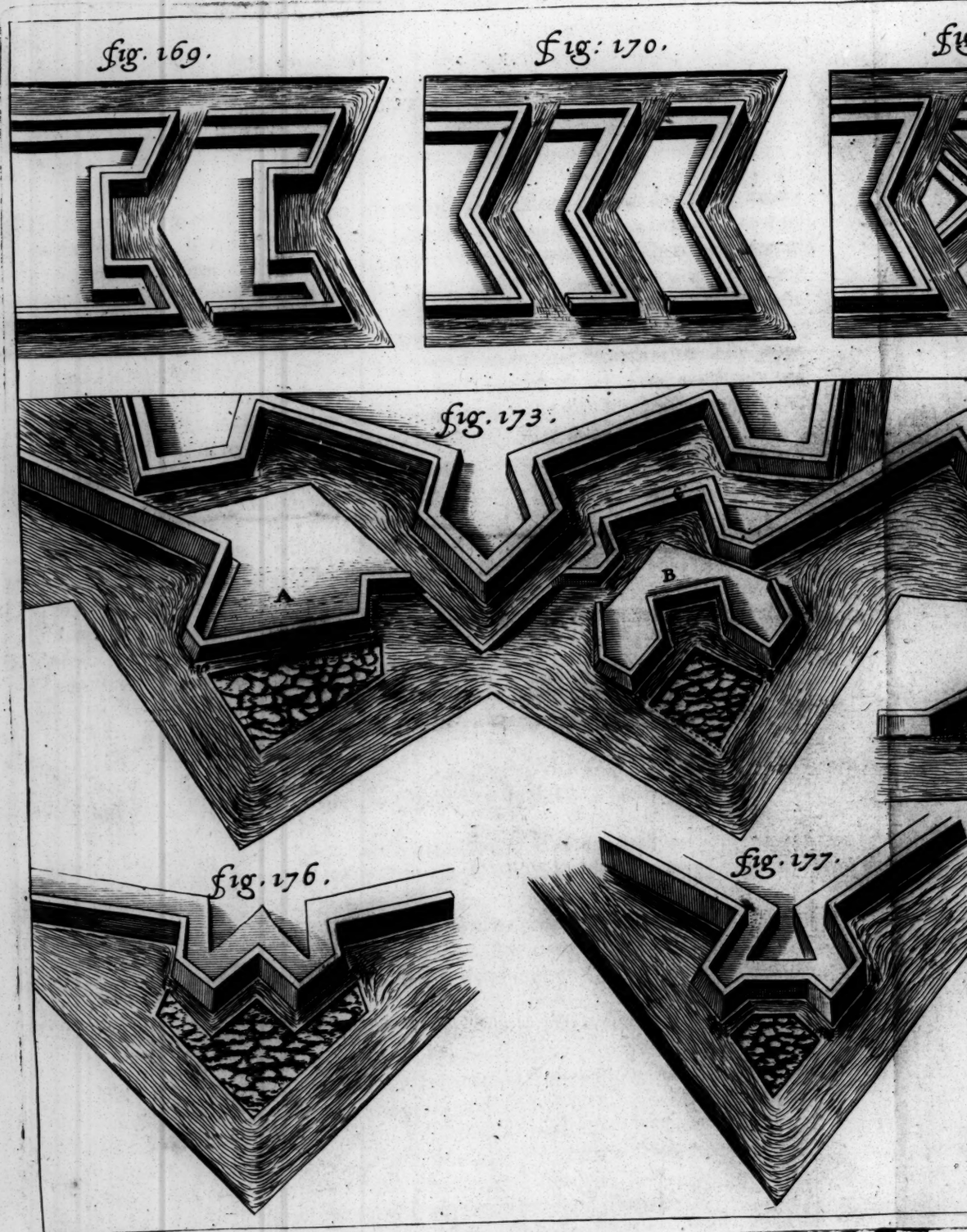


fig. 169.
fig. 170.
fig. 173.
A
B
fig. 176.
fig. 177.

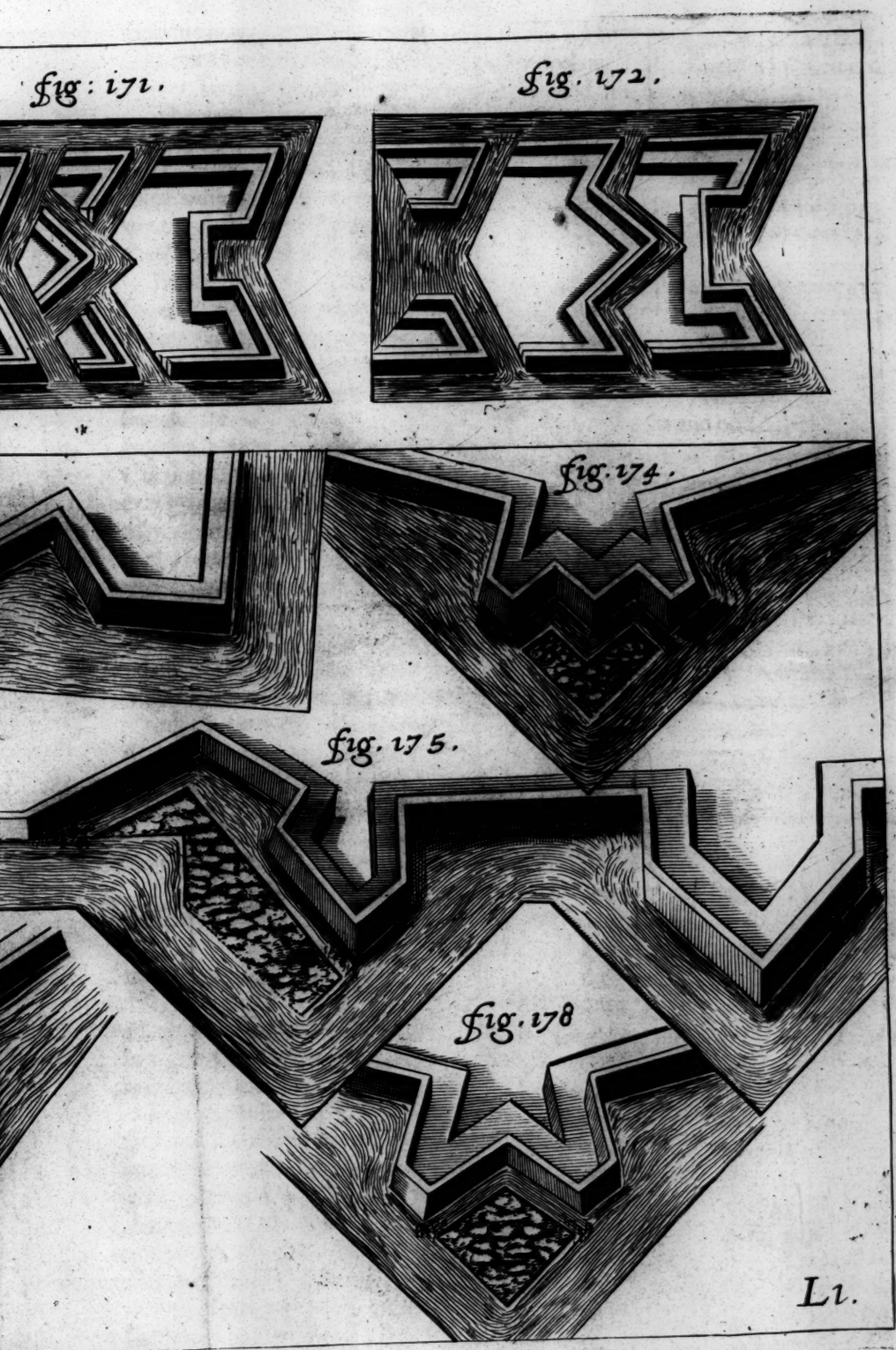
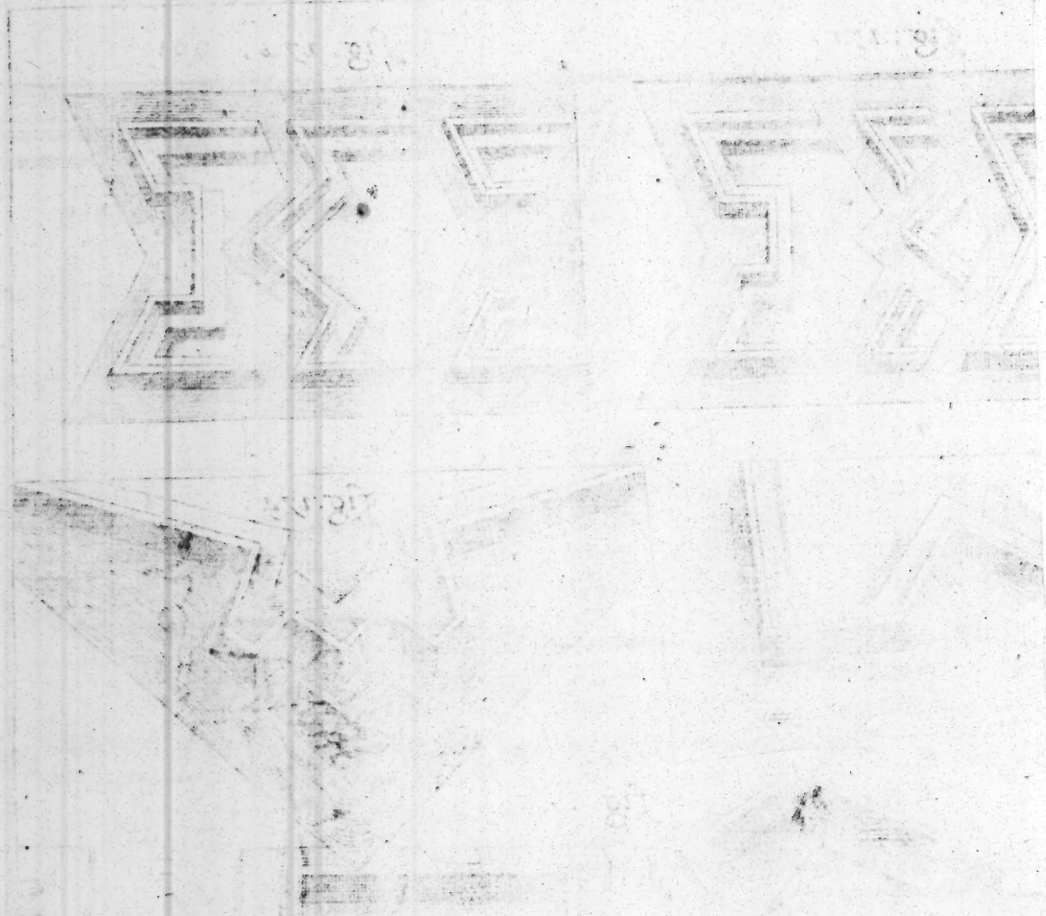


fig: 171.
fig. 172.
fig. 174.
fig. 175.
fig. 178



ted, and the cutting off, which ought nevertheleſſe to be done, becauſe one takes the Earth out of the *ditch*, to make up the cutting off withall: one muſt obſerve alſo, that this cutting off muſt be made, as ſtrong as poſſible may be. The cuttings off are not made only, while an Enemie is approching towards you, but alſo when Towns and Forts are firſt fortified.

Your Generall cuttings off in *Tenailles* doth not differ from that which is made in *Horne-workes*, ſaving that one make a *Tenaille*, in ſtead of a *Horne-worke*.

The particular cuttings off of *Horn-workes* is after ſo many waies, that one cannot ſhew here all the kindes of them. A Cutting off is repreſented unto you in the 171 figure, where a *Horne-worke* is cut off, and two *Ravelings* made in the ſides of it, which are defended by a third, which is behinde the others: and though they have a ſufficient defence of themſelves, yet the defence of the other Raveling is added to them over and above, and is defended from the *Tenaille*, which is after it.

Beſides this, there is an other kinde of cutting of a *Horn-worke* ſhowne in the 172 figure. In imitating theſe cuttings off one may make many others, as neceſſity may permit, and as an Enemy attempts upon you, all which is impoſſible to marke out here.

A Generall Cutting off of a great *Wall* or *Rampard* is uſed very ſeldome, becauſe the Beſeigers, and the Beſeiged will at laſt grow vveary thereof. Nevertheleſſe, this hapned in the ſeige of *Oſtend*, vvhich laſted three yeares, three months and odd dayes: for aſſoone as the Enemy had got into the wall by ſapping and ſpringing of mines, they preſently had an other Cutting of ready to entertaine them: in ſo much that during this ſeige, there were many *Counterapproches* againſt approches, *Countermines* againſt the Enemies mines, ſo that the Enemie could not get for a long time ſcarcly an inch of ground upon our men, for there were above fourty mines ſprung on both ſides, and vvhen the Earth fell our men fought for that and turned up the earth againſt them, for theſe Generall and Royall cuttings off laſted, till the enemy had got more then halfe the Tovvne, before they gane over the vvhole. And though ſuch a *ſeige*, and ſuch a great cuttings off happens but ſeldome, yet you ſhall ſee an exſample thereof in the figure 173. vvhere is ſhovvn how one ought to quit a vvvhole part, of a Tovvne, or Fortreſſe, vvith the *Curtaine* and Bulvvarks, and hovv one by a cutting off a *Bulvvark*, or a *Curtaine* is more uſuall, vvhereof vvee ſaw an exſample at the ſeige of the *Boſch* in the *Vuchter* Bulvvarke, as alſo the laſt yeare at the ſeige of *Breda*, vvhere both the *Ginnakis* and *Haghish Hornworks*, with both theſe *Bulvvarks* were moſt dangerouſly cut off. Now to repreſent unto you ſome cuttings off, vvhich you may ſee in the 173 figure, marked vvith A, B, and C. The letter C ſhovves you hovv one ought to quit a vvhole *Bulvvark*, and hovv you ought to make your *Capitall line* after a Bulvvark is cut off.

Likevviſe other kinds of cuttings off of *Bulvvarks*, are repreſented unto you in the figure 174, 175, 176, 177. and 178. after vvhich manner, you may make many others, and change, and order them, as an Enemie comes neere you, and as the commodiouſneſſe of the place ſhall require.

It happens alſo ſometimes, that *Curtaines* are cut off invvardly, vvhen as an Enemy may aſſault them vvith advantage, becauſe of their length. You may then cut them of as is ſhovvn in 173 figure, vvhen you have time enough to cut them off *royally*. But if time vvill not permit you to make a royall fortification, then you muſt make uſe of *Trauerſes*.

It is impoſſible to cut off a *Falſebray*, becauſe of the little ſpace, vvhich is in it. Notvvithſtanding one may caſt up ſome *Trauerſes* in it, eſpeciall on that ſide, vvhich the Enemy ſeeks to take in, and towards vvhich part he would advance his gallery, to the end, you may not give too much to an Enemy, but keep and maintaine the place, as much as poſſible may be. For the *Beſeiged* may lay hold on the ſame advantage, as their Enemy doth, when he is once got into the *Falſebray*, and though when he is in that, they may cover the rooſe of it with planckes, one may nevertheleſſe, ſet fire on it, and diſaccommodate the Enemy on all ſides.

As for other vvorkes as *Ravelings*, and *Halfmoones*, you may ſee how they are cut off after the ſame manner, as the Bulvvarks are, if the vvorke which is to be cut off be great enough, and have place enough in it to be cut off.

But for aſmuch as all this here ſhowne, concerneth principally the defence, which ought

to be considered in all ordinary Fortresses, so one must have a speciall care to the *materiais* whereof these workes are made: for in making of them, you must choose the best Earth that is to be got, which will make your vvorks the stronger.

In outworks you may alwayes rake in the Earth, which is digged out of the moate. But because that sandy earth, or Earth mingled with sand, is not so good, it is lyned with rise, or Brush, which is layd betwixt and upon it

In great *Bulwarkes*, where there is not Earth enough and besides that is sandy it must bee layd with rowes of Brush, driven them in with stakes and sparres of houses shot down with canon. But when the ground is so sandy, that you cannot worke it alone, then you must lay dung, and straw, and other things betwixt it to make it hold together, and you must wet the Earth, as many times as is needfull. You may fortifie your *parapets* with *gabions*, when you cannot make them otherwise, and likewise you may sett great *musket baskets* upon the top of the *parapet*, that it may be covered the better.

In *outworkes* one may make use of the ordinarie *profile* when you have time enough to make cuttings off, or you may make them long before hand. But the works which are made in great hast, have no certaine rule: howsoever, you must make then as strong as possible may be, and as meanes, and time will give you leave.

Touching the cuttings off of *Bulwarks* and *Curtains* one can give likewise no certain rule. Onely this you must ever have a care, that all inward works, & cuttings off lie open towards the *Towne* or *Fortresse*, with this *proviso* also, that they be not made so high, but that the great works may over look and commaund them: For, if the *Rampard* of the cutting off be lower then the high *rampad* of the Towne, then the Enemies canon can do it no great harme, because they are defended from the great *rampard*. Againe, the Enemy cannot discover the place and the forme of the cutting off, according to which one may governe themselves otherwise. It is certaine also, that one cannot beate an Enemy from a high place, which is neere at hand, because he is blinded and covered with the wall or *rampard*.

All these things being finished, when one is assured, that an Enemie is ready to spring his *Mine*, which cannot be found out, one must then strengthen, and double the guards in every place, and bring your canon to those places, where they may most gaule and flanck the Enemy. One ought to have an eye, aswell on other places, as onely upon the *breach*, which is made by the springing of the mine. For an Enemy hoping that he may have drawn, the most of the forces in a Town or Fortresse to defend the *Breach*, may attempt some other place of the Fortresse, which is not thought upon, and so become master of such a place, which is not provided with a sufficient defence.

After that the *Breache* is made, the *Besieged* must expect to be presently assaulted, which they must maintaine, and make good as long as possibly they can by defending the breach courageously, in doing whereof, they must throw downe from the top of it abundance of these *square tanternails* spoken of in the chapter before, for to annoy and prick the Enemy, when he seekes to mount up and to enter it.

Upon the top of the *Breach* also, if they have time they may cast up a brestworke, as Sir Francis Vere did in Ostend, or set up some turn-pikes, to hinder the enemy for entring, and to strike in some *pallisadoes* upon the top of it, having *clubbs*, *flayles*, stones and ashes to offend them.

It is necessary, when the Enemie strives to enter it, that the souldiers fight courageously, & that the officers should encourage them with their presence to carry themselves like brave men, that being a place to gaine honour in, by giving them also promisses of reward, and when they grow weary, to see that they be seconded with fresh men, which stand in a readinesse behinde the *Rampard*, to relieve them.

When they are not able to maintaine and defend the breach any longer, then they must retire into the *cutting off*, and take a new courage, and a hart of grace in fighting behinde a new Rampard, in making resistance as long as ever they are able.